Gas Journal

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Editorial Notes

Selling Good Service

To our mind, Mr. Clarke, in the opening paragraphs of his Presidential Address to the Eastern Counties Gas Managers' Association, which, delivered to-day, is published *in extenso* on later pages, is far too diffident. He thanks the Association, obviously in all sincerity, for his election as President because he is in control of one of the "smaller undertakings." He almost apologises for the fact that he is Engineer, Manager, and Secretary to the Stamford Gas Company—which apology is totally unnecessary in the light of what he has done, and is doing, to promote gas service in the area he supplies.

We have emphasized on many occasions that those in control of the "smaller undertakings" have the great advantage of easier personal contact with their consumers—a factor which must not be lightly ignored. And the chief impression we gain from Mr. Clarke's Address is that he is fully alive to this fact. But, if this personal contact is to be properly effective, then the service offered must be good. Mr. Clarke's aim on taking control of his Undertaking was to give such service, and it is obvious from his Address that he has succeeded in large measure. We like, for example, his insistence that, irrespective of size, every undertaking should strive for uniformity of both composition and pressure of the gas supplied, and we like better still what he has done in Stamford in this regard. The pressure charts which he includes in his Address show that all parts of his district are well served at all times with an adequate supply of gas, and his calorific value chart of the gas sent out from the works is an example to many another larger, as well as smaller, undertaking.

Mr. Clarke deals in considerable detail with the exceedingly important question of supplying gas of uniform composition and heating value, and we are glad that he shares our views on the matter of "diluting" the gas made in horizontal retorts. "Diluting" in Mr. Clarke's case would, we suggest, be more happily expressed by the term "blending," for he is lowering the percentage of inerts in reducing the calorific value to the standard supplied. The practice, which is so common in many small gas-works, of reducing the calorific value by pulling on the retorts is to be deprecated in that it is impossible to afford the consumer the supply which he requires—gas of constant quality and gravity. Also, one must consider the damage done to refractory materials by pulling, and its general effect on working results and the life of the setting.

Coal Gas Dilution

MANY methods of dilution of horizontal retort gas are carried out at the present time, and with very different results on the final inert content of the gas supplied. In one instance of which we are aware flue gases and blue water gas are admixed with the horizontal retort gas, and the final gas contains more than 20% of inerts. While we appreciate that the quality of the gas supplied is constant, it does seem to us unfortunate that any system of dilution should mean the sending out from the the works of such a large quantity of useless material. In other instances the practice is a controlled admixture of producer gas, and those in favour of this system put forward as the particular advantages of the use of producer gas from producers utilized for the heating of the settings, the low capital cost of the installation, the saving in labour and the infinitesimal cost of repairs and maintenance. Certainly the expenditure involved is small, and permits of the adoption of the system in the smallest gas-works; and with proper control the inerts in the final gas can be kept at a constant and a reasonably low figure.

But there is another method available for the small works, in regard to the adoption of which Mr. Clarke makes out a strong case, and that is by blue gas generated in the modern automatically operated plant; and we think this method is to be very strongly recommended. A year ago Mr. Clarke installed a Humphreys & Glasgow unit having a daily rating of 120,000 cu.ft.; and as this question of dilution is of such consequence to the smaller undertakings, and should be exercising the minds of those responsible for their conduct, we quote the following from Mr. Clarke's Address: "It is too soon to make any statement regarding upkeep costs, but I can say that up to date they have been negligible. The small amount of attention which the plant requires is easily provided by the retort house stokers in the course of their ordinary duties, so that there are no extra labour charges for water gas operation. Having had some earlier water gas experience I can testify to the amazing consistency of both quality and quantity of the gas produced in auto-

matic plant as compared with the older type of hand-operated plant. . . . The automaticity of this type of plant and the elimination of extra labour has definitely made it possible to produce blue water gas at a cost per therm lower than our coal gas." Considering that the carbonizing plant at Stamford consists of stop-end horizontal retorts with semi-manual charging, Mr. Clarke has done exceedingly well in lowering the inert content of the gas supplies to the town from over 26 to less than 15%, while at the same time ensuring that the latter figure is constant.

Coke Sales and Small Works

We congratulate Mr. Clarke also on the manner in which he has dealt with the sale of coke. There is a large and growing public demand for a uniform and properly graded smokeless solid fuel, and small undertakings can quite easily afford such a supply and at a price which will more than cover the cost of treatment. Installation of coke cutting and screening plant at Stamford transformed what was a difficult coke market into a profitable and thoroughly satisfactory one, and Mr. Clarke explains that the demand for graded coke is actually in excess of supply.

The small gas undertaking has a definite responsibility to the whole Gas Industry, for the prestige of the Industry depends on good service in every area of supply. Bad service in one area does in fact tend to nullify good service in another; and it is plain enough from Mr. Clarke's Address that there is no reason, apart from apathy, why good service should not be given irrespective of the size of the undertaking. And as an example of the reward of good service there is the statement in Mr. Clarke's Address that from 1927 to 1934 gas sales at Stamford increased by 14% in a residential and agricultural area. During that time the price of gas has been reduced by 24%, and on no occasion has a reduction in price depleted the revenue. The Stamford Undertaking has enterprise; and so has its Engineer, Manager, and Secretary.

Local Publicity and the B.C.G.A.

Topical and decidedly controversial topics are discussed fearlessly by Mr. H. C. Jackson, of the Stretford and District Gas Board, in a Paper before the Manchester and District Junior Gas Association which is published in our columns to-day. Having paid enthusiastic tribute to the British Commercial Gas Association's Training Courses for Salesmanship, he states straight away that, in regard to general propaganda, local undertakings are not obtaining the benefit they might from the Association. In his own words, "the fact of the B.C.G.A. being stationed in London adds to our difficulties . . . the absence of direct personal representation by members of their advertising staff tends to discourage the efforts of many undertakings in co-operating on every possible occasion in the various advertising schemes initiated by the Association." His appeal is for the establishment of a Branch Office of the B.C.G.A. in the North, with a staff available to pay regular visits to local undertakings to study and analyze their needs, so that schemes could be adopted which would prove effective in their own particular area.

This is not a new idea, and we have consistently urged that the national work of the B.C.G.A.—work essential to the progress of the Industry—should be backed up by local undertakings. National publicity ought to be regarded as a background to specialized local propaganda. To our mind there is no doubt that the Association has in large measure co-ordinated and stimulated local publicity; and one of the most gratifying features of its work of late is that the Association has assisted far more closely and in more schemes of local advertising. The point is, however, whether this tying-up could not be made more effective. Publicity is a specialized business, and conditions in different areas of supply vary enormously. Uniformly planned local publicity is by no means to be recommended, and we think with Mr. Jackson that much more local co-operation in sales propaganda is needed.

But Mr. Jackson must realize that branch offices of the B.C.G.A. necessitate the expenditure of money. If undertakings in any specified area were prepared co-operatively to finance a branch office of the B.C.G.A. we can visualize nothing but good of the outcome. On the other hand, if on the basis of its present small funds the Association were to attempt to set up a series of branch offices, we suggest that the result would be to nullify the strength of the Association to serve the Industry as a National Industry the claims of which must be put before the whole of the community.

Apart from this, however, there are many ways in which undertakings in an area where conditions are comparable might get together to great advantage. One way is in avoiding overlapping of local propaganda, as Mr. Jackson suggests, and another is the interchange of showroom displays. Frequent change of display is desirable, and it is also desirable that the displays themselves should be of a high standard. The motor 'bus services bring all in easy reach of shopping centres where goods are attractively displayed, and to-day dwellers in villages expect attractive showroom windows. Such displays cost money, and we think it would be an excellent plan if groups of undertakings decided to get the best value for this expenditure by interchange. Also, such an arrangement, and others of a similar nature, could become much more effective if, with further funds, experts appointed by the British Commercial Gas Association were available to give advice. The suggestions put forward by Mr. Jackson are much to the point; for them to be put in effect we need a greater measure of co-operation between undertaking and undertaking and greater generosity in subscriptions to the B.C.G.A.

The Kettering Enquiry

We call attention, and necessarily without comment, to a distinctly interesting party opposition to the application of the Kettering Gas Company for a Special Order under the Gas Undertakings Acts, 1920-34. The Kettering Company has made history in gas legislation, and it is continuing an energetic policy. Our report of the enquiry before the Director of Gas Administration appears on later pages, and it will be seen that it centres round a twenty-one years' agreement to take coke oven gas from the Corby Works of Stewarts & Lloyds. The objects of the Order are to extend the limits of supply, raise additional capital and consolidate existing capital, authorize the manufacture and storage of gas on new lands, and generally to bring the legislation applying to the Company up to date. The customary objections to the amount of differentials in price in certain areas were raised, and a certain Council submitted that the Board of Trade had no powers to do what the Kettering Company asked, which was to supply gas in an area in which the Council is the authorized undertaker; but what interests us here is the opposition of Imperial Chemical Industries, Ltd.

As a matter of fact, this opposition was ruled out on the grounds that Imperial Chemical Industries has no

direct interest in the district of the Gas Company—in other words, that I.C.I. has no property in the area of supply. The reason for the opposition, however, was that the Kettering Order might conceivably be used as a precedent, and might injure Imperial Chemical Industries in some other part of the country in the future. Objection was taken by I.C.I. to a clause in the Order which would empower the Kettering Gas Company " to acquire, hold, and use any patent rights or licences for the use of any invention in relation to the manufacture, supply, or distribution of gas, or the conversion, manufacture, or utilization of residual products obtainable in or arising from such manufacture, or from the materials used therein."

Who Should Decide?

In course of time, no doubt, the question of whether a particular street in a built-up area is adequately illuminated will be decided by a competent lighting engineer, but meanwhile the question is too often left to less authoritative methods of determination. This is to be regretted. In the " JOURNAL " some weeks ago we remarked upon the events which " seemed to indicate the need for some reform of the principles governing street lighting," and in the paper lately presented by him to the Illuminating Engineering Society Mr. C. A. Masterman furnishes convincing reasons for concluding the existence of " a very definite relation between street accidents and street lighting."

The review of the problem of street lighting which has been recently entrusted to a Committee of the Ministry of Transport will certainly help, and help is badly needed. While matters remain as they are, there seems little hope of meeting Mr. Masterman's criticism that " the provision of good lighting in our streets and the proper use of the Street Lighting Specification are handicapped by the fact that there are far too few engineers who have made a special study of the art, science, and economics of street lighting." What is adequate street lighting is essentially a matter for experts to decide, and the sooner this is universally recognized, and as universally acted upon, the better will it be for pedestrian and motorist alike. Not long ago, following upon a fatal car crash, a coroner's jury added to their verdict a rider that the road in which the accident occurred should have better lighting. It does not seem unfair to assume that this jury was not comprised of street lighting experts; yet, of course, their rider may have been abundantly justified. There are numberless roads which should have better lighting. But if a coroner's jury cannot be expected to be made up of experts, the same remark will with equal force apply to the membership of a borough council; and this particular council are reported to have refused to improve the lighting of the road in question, despite the jury's rider.

Without apportioning either credit or blame, it can be urged that this is an unsatisfactory position. The council may have been guided towards their decision by the opinion of an expert, but if not the case certainly emphasizes the need for the advice of engineers who have made a special study of the science of street lighting. So, too, does a report which is stated to have been submitted by the Institution of Municipal and County Engineers to the Ministry of Transport. This report, dealing with the circumstances attending 7,000 accidents, indicates that the worst accident hour was between 10 and 11 p.m. on Saturdays, Sundays, and holidays. The expert lighting engineer could say in which particular cases there would have been less likelihood of the accident occurring had the lighting conditions been different.

Government Grants and Income-Tax

WE have had occasion from time to time to call attention to the claim made by the Inland Revenue that grants received from the Treasury under the Development (Loans Guarantees and Grants) Act, 1929, were liable to respect of income-tax. From a commonsense point of view such a claim is curious, particularly so when the history of the grants is considered. The grants were made to statutory companies (including the railway companies) who at the urgent request of the Government carried out work designed to provide employment, and the amount of the grant was fixed by a Special Committee after careful consideration of all the facts and circumstances of each particular case. There is no evidence that at the time the grants were made any one considered that they would be liable to income-tax, and without disrespect it may not be unfair to say that such a claim was only made as an afterthought by the Inland Revenue.

In making the claim, however, it was necessary for the Inland Revenue to contend that the circumstances under which the grants were made differed from those which prevailed in the case of the Seaham Harbour Dock Company *v.* Crook, which the House of Lords had already decided in favour of the taxpayer. In that case it was held that grants made by the Treasury before the passing of the Development Act, 1929, were not to be regarded as profits or gains arising or accruing from trade, and were therefore not taxable under Case 1 of Schedule D.

The Inland Revenue, however, contended that grants made under the Development Act, 1929, differed materially in character from that under consideration in the Seaham Harbour case. Alternatively the Inland Revenue claimed that the grants were taxable under Rule 21 of the General Rules of the Income-Tax Act, 1918. In order to understand this alternative claim it is necessary to remember that it was invariably a condition imposed by the Treasury that, if the work to which the grant applied could not be financed from the existing resources of a company, the necessary funds must be secured by borrowing. The general public who lend money by the purchase of debenture stock or otherwise not unnaturally expect to be paid interest, and in ordinary cases such interest is paid by the company out of its taxed profits. Before paying interest the company is allowed to deduct the income-tax payable by the debenture stockholder, and since the interest is paid out of funds already taxed the company is allowed to retain the amount so deducted.

In the case under consideration the Crown claimed the interest on the money lent to the Company had, or should have, been paid in whole or in part out of money received from the Treasury, which was to be regarded as an untaxed fund. It was urged, therefore, that Rule 21 of the General Rules applied, and that, as the interest payment was made out of an untaxed fund, the company was not entitled to retain amounts deducted in respect of income-tax from the interest payment, but on the contrary must hand these amounts over to the Inland Revenue. In order to contest this issue the Inland Revenue required the Special Commissioners to make an assessment upon a selected company under Rule 21. This the Special Commissioners declined to do on the ground that no *prima facie* case of liability under Rule 21 existed. The Crown was therefore reduced to relying upon the claim that the Development Grants were profits or gains arising or accruing from trade under Case 1 Schedule D.

This issue was decided by the Special Commissioners last week, and their decision was that the circumstances under which Development Grants have been made in

virtue of the Development Act, 1929, could not from an income-tax point of view be distinguished from the grant made before 1929 to the Seaham Harbour Dock Company. The question had therefore been settled by the House of Lords in favour of the taxpayer in the Seaham Harbour case. The decision of the Special Commissioners that Development Grants are not liable to income-tax is of considerable importance to the large number of public utility companies who responded to the call of the Government to do everything possible for the unemployed.

It is to be hoped that the Crown will accept this decision, and not travel up the painful and costly path that leads to the House of Lords via the King's Bench and Court of Appeal. Such appeals are costly enough to great industries; but what prospect has the small taxpayer, who may have a genuine and *bona fide* dispute with the Inland Revenue of carrying his case through the four tribunals in which it must be argued before a final decision can be obtained. Generally it pays such a one to regard his Local Inspector as a being infallible; although such infallibility is often fictitious.

A New Australian Contemporary

THE Gas Industry, if it is to place itself in an impregnable position, must realize that a primary requisite is co-operation between the units which compose the Industry. With these words Mr. H. Tindale, General Manager of the Australian Gas Light Company, gives a " send-off " to a new monthly journal produced by the Gas Managers' Association of New South Wales. In the course of his editorial comments in the first issue, the Editor of the *Australian Gas Age*, as it has been styled, admits that they have various English and American publications, each of which plays its part towards achieving the same objective as the Association are setting out to obtain; but he reminds his readers that conditions in Australia are vastly different in many respects from those existing elsewhere—and it is felt that the Gas Industry of Australia has reached a sufficient degree of importance to warrant the publication of its own journal.

One of the difficulties in creating the first issue of any journal is the visualization of the finished product. It is apparent only in the mind's eye until the printer is able to provide a complete copy. Then there may be elation or there may be disappointment. But we feel that the sponsors of this new venture need have little fear of the latter in regard to their first issue, and the Association are to be congratulated upon the step they have taken. It should be of great value to the Gas Industry of the Commonwealth.

Personal

Presentation to Mr. A. W. Smith.

Mr. A. W. SMITH, General Manager and Secretary of the Birmingham Gas Department, was entertained by the senior members of his staff on May 8 to a complimentary Dinner at the Queen's Hotel to mark the completion of forty years' service with the Department. Mr. E. B. Tomlinson, Engineer-in-Chief, presided and traced Mr. Smith's career up to his appointment as Head of the Department seventeen years ago, and stated that, in modern times at any rate, he was the first Official of the Birmingham Corporation to progress from a junior clerkship to the head of the same Department—and that, incidentally, the largest municipal Gas Undertaking in the world. Mr. Tomlinson referred especially to the courtesy and consideration which Mr. Smith had invariably shown to the members of the staff.

As a memento of the occasion an inscribed silver salver was presented to Mr. Smith, who suitably acknowledged the gift and expressed his gratification at the happy relationship which existed between the various sections of the staff.

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Mr. T. H. BARSON, who has for a number of years been General Manager of the Broken Hill and Suburban Gas Company, Ltd. (N.S.W.), has recently retired, his place being taken by Mr. R. I. A. RICHARDS, Secretary of the Company.

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Mr. D. W. DAVIES, Engineer and Manager of the Tredegar Urban District Council Gas Department, has been appointed Gas, Water, and Electricity Engineer and Manager to the Council with an increase in salary as from the date of his new appointment.

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Sir FRANCIS GOODENOUGH, C.B.E., has received from the President of the Board of Education " by command of His Majesty The King," a silver medal commemorative of the Jubilee of Their Majesties.

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Mr. W. A. BLACKWELL has been appointed from a short leet as Secretary of the Berwick and Tweedmouth Gas Company in succession to Mr. J. M. Edney. For the past eighteen years Mr. Blackwell has been Assistant Chief Clerk to the Mansfield Corporation Gas Undertaking. There were thirty-two applicants for the post.

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It is announced that the Rt. Hon. Sir FRANCIS LINDLEY, G.C.M.G., C.B., C.B.E., has been appointed a Director of the Imperial Continental Gas Association.

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Mr. H. R. S. WILLIAMS, formerly Engineer and Manager of Altrincham Gas Company, who died on Feb. 3 last, left estate of the gross value of £2,555, with net personalty £2,482. Probate of his will has been granted to his widow, Mrs. B. Williams, the sole executrix.

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At a meeting of the Federation of Gas Employers on Friday, Councillor WALTER MUTER was unanimously elected Chairman of the Scottish District of the Federation in the place of the late Councillor W. J. Harvey, Edinburgh, who rendered distinguished services to the Industry over a long number of years. Councillor Muter has had a varied experience in salaries and wages negotiations which should stand him in good stead in his new appointment. In addition to being Convener of Edinburgh Corporation Gas Committee, he is, of course, President of the British Commercial Gas Association.

Forthcoming Engagements

May.

16.—B.C.G.A.—Yorkshire District Conference at York.
16.—MIDLAND ASSOCIATION.—Spring Meeting at Hereford.
17.—SOUTHERN ASSOCIATION (WESTERN DISTRICT).—Commercial Meeting, Rougemont Hotel, Exeter, 2.30 p.m.
18.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting and Paper by Mr. C. A. Newham.
18.—WESTERN JUNIOR ASSOCIATION.—Annual Meeting at Burnham-on-Sea.
22.—BRITISH GAS FEDERATION.—Luncheon at B.I.F., Birmingham.
23.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, 2.30 p.m.
23.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Annual Meeting, Royal Engineers' Hall, Llanelly. Presidential Address of Mr. H. Barker.
28.—NATIONAL JOINT INDUSTRIAL COUNCIL FOR THE GAS INDUSTRY.—Annual Meeting, 28, Grosvenor Gardens, S.W. 1, 12 noon.
29.—B.C.G.A.—Midland District Conference at Worcester.

June.

3.—I.G.E.—Finance Sub-Committee, 1.45 p.m.; Membership Sub-Committee, 2.30 p.m.; General Purposes Committee, 3.15 p.m.; Council Meeting, 4.30 p.m.
4-7.—I.G.E.—Annual General Meeting in London.
11.—I.G.E.—Gas Education Executive Committee, 4 p.m.
19.—ASSOCIATION OF STATUTORY INSPECTORS OF GAS METERS.—Annual General Meeting, County Hall, Westminster, 10.15 a.m.
20.—I.G.E.—Refractory Materials Joint Committee, Stoke-on-Trent, 2.30 p.m.

News in Brief

Newbridge Switches are used on the lights and gas fires in the All-Gas Exhibition House arranged by the Alliance and Dublin Consumers' Gas Company.

Application to the Board of Trade is to be made by the Portsmouth Gas Company for a Special Order under the Gas Undertakings Acts, 1920 to 1934, to authorize the Company to utilize certain land for gas-works and storage purposes.

George Wilson Gas Meters, Ltd., have opened a new depôt at Castleford, Yorkshire, where they will hold stocks of the most popular sizes of meters. This depôt will be worked from the Leeds office, 7, New Station Street, Leeds (Telephone 21094).

New Capital Issue.—The Horley District Gas Company recently made an issue of £7,100 of 4% perpetual debenture stock, which was nearly four times oversubscribed. Tenders ranged from par to £108%, the lowest accepted tender being at £103%.

During the Jubilee Celebrations the front of the Offices and Works of the Parkinson Stove Company, Ltd., of Stechford, were floodlighted by gas from dusk until midnight. The lamps used were those manufactured by Messrs. W. Parkinson & Co., their associated concern.

The Gas-Works at Sens, belonging to the Société de Gaz et Eaux have recently been completely modernized, the old carbonizing plant having been replaced by the latest Picard vertical chamber retorts. The daily output of gas at present ranges between 162,300 and 218,800 cu.ft.

Large Crowds of Visitors during Jubilee Week have been shown round the Barton Power Station, and the Bradford Road and Partington Gas-Works, Manchester, and have welcomed the opportunity of inspecting two gas plants which are among the largest and most up-to-date in the country.

In Connection with the Jubilee the *Royal Leamington Spa Courier and Warwickshire Standard* devoted nearly a column and a half to an interesting review of the progress and developments of the Leamington Priors Gas Company from the time of its inception 116 years ago. Comparative figures showed that gas sales have increased by over 150 million cu.ft. during the past twenty-five years.

Sir Francis Goodenough, at an invitation conveyed through Colonel Kennington, of the Great Grimsby Gas Company, was the guest, on Wednesday, May 8, at a largely attended luncheon organized by the Grimsby Chamber of Commerce and the Grimsby Rotary Club, and gave an address on "The Principles of Commerce." Subsequent speakers bore cordial testimony to the efficient service of the local Gas Company and its Manager.

Manchester's Transport Committee Manager, in a report to the City Council, states that the motor buses owned by the Corporation consume a certain amount of motor spirit which is purchased from the Gas Department. During the twelve months which ended in February last, 53,100 gallons were obtained in this way at a cost of £2,785. He adds: "Following research which is now being undertaken on oil engines and fuel, it may be possible in the near future to use oil obtained as a by-product of the Gas Department."

The Rotary Movement and the Gas Industry.—During the course of the Annual Conference of Rotary International (Great Britain and Ireland) which took place at Margate last week-end a vocational meeting of Rotarians connected with the gas and coal industries was held under the Chairmanship of Mr. C. F. Botley and the Vice-Chairmanship of Mr. E. Ablett and Mr. W. B. Lockerbie (Sunderland). Among the subjects discussed at the gathering were (1) the Gas Industry and its Present Position and (2) Problems of the Coal Industry from Mine to Retailer.

A Travelling Gas Showroom has during the past week paid visits to Tranent and Haddington, where demonstrations of cooking by gas were given in presence of large and interested audiences.

The Birkenhead Gas Department and two local picture theatres are co-operating in a cake-baking competition open to all who live within the area served by the Gas Department. It is stipulated that the cakes must be baked in a gas oven. The prize-winning cakes will be decided by Miss M. H. Hamer, of the Radiation Research Kitchen.

The Glasgow Century of Progress Exhibition, running in the Kelvin Hall, Glasgow, from May 6 to 18, devotes an interesting section to the activities of the Corporation Gas Department. The exhibits show the progress and development of the Gas Industry during the last 100 years, and include examples of early forms of lighting, heating, and cooking prior to the introduction of gas, along with models of various parts of gas-works plant There are also numerous diagrams illustrating modern gas-works plant. Old types of gas appliances are on view, together with modern heaters, cookers, and fires. A film is being shown daily illustrating the uses of gas.

Marcus Magill, whose latest novel, "Hide, and I'll Find You," has been screened by British International Pictures for general release next Monday (May 20) under the title of "It's a Bet," is a pen-name concealing the identity of a writer not unknown to the Gas Industry—Mr. Brian Hill. Mr. Hill, who is a son of Sir Leonard Hill, the well-known scientist, has for some years been a member of the editorial staff of the British Commercial Gas Association. The plot of the film, in which Gene Gerrard and Helen Chandler are the stars, concerns the adventures of a young man who bets a newspaper proprietor that he will disappear for a month, and it contains some original and amusing situations.

Cookery Demonstrations organized by the Bridgend Gas Company in conjunction with the Parkinson Stove Company, Ltd., were held with great success during the Jubilee celebrations. The exhibition, arranged by Mr. H. G. Horwood, the Engineer and Manager, was opened by Colonel A. P. James, V.D., D.L., Chairman of the Bridgend Gas Company. The Cookery Lectures, held in conjunction with a display of modern Parkinson gas appliances, created considerable interest, and attendances throughout the period were very good indeed. As usual the great feature of the week was the cooking of a complete dinner, and it was very obvious that the audience was greatly impressed by the economy in gas consumption of the Parkinson cooker. The cookery lectures were given by Miss Helen Crawford Fox, M.C.A., of the Parkinson Stove Company Research Kitchen.

Obituary

The death occurred on May 5, in his 76th year, of Mr. ROBERT MUIR, who was for many years Manager of the Galston Gas-Works.

A native of Darvel, Mr. Muir began his career in the Gas Industry with the late Mrs. William Baird, of Rosemount, in 1882, when he took charge of small private works for providing gas for the Mansion House. After holding that appointment for a period of eight years he entered the service of the Kilmarnock Corporation at the gas-works under the late Mr. Wm. Fairweather, and in 1892 he was appointed Manager of the Galston works. His son, Mr. James Muir, who was Assistant Manager of the works for a number of years, was appointed to succeed his father, on the latter's retirement, and Mr. Robert Muir's services were retained in the capacity of consulting engineer.

Mr. Muir had been a member of North British Association of Gas Managers since 1894, and was a member of the Committee for a long period. In 1917-18 he was President of the Association.

Mr. Muir was a member of St. Peters Lodge No. 331, and took an interest in everything pertaining to the Masonic craft.

Silver Jubilee Gas Floodlighting

Below is a further list of buildings and other places floodlighted by gas in connection with the Jubilee Celebrations—based upon information supplied by the Secretary of the Jubilee Celebrations Committee (Mr. J. R. W. Alexander, 28, Grosvenor Gardens, S.W. 1):

Dunfermline.—City Chambers.
Hampton Court.—Hampton Court Hotel.
Kendal.—Kendal Castle.
Leamington.—War Memorial.
Sheppy.—Minster Abbey Church and Gate House.
Todmorden.—Centre Vale Mansion and Garden Remembrance.

B.C.G.A. Annual Conference

Advance Programme of Edinburgh Meeting

The following outline of programme is announced for the Twenty-Fourth Annual Meeting and Conference of the British Commercial Gas Association to be held in Edinburgh from Sept. 28 to Oct. 1 next under the Presidency of Councillor WALTER MUTER.

SATURDAY, SEPT. 28.

Evening.

Civic Reception by the Lord Provost of Edinburgh and the Members of the City Council.

SUNDAY, SEPT. 29.

Organized excursions (to which ladies will be invited) to places of interest in Scotland.
Golfing facilities will be available at courses in and around Edinburgh.

MONDAY, SEPT. 30.

Business Session of the Conference throughout the day.
Official Luncheon by the City of Edinburgh to the Conference Delegates.

TUESDAY, OCT. 1.

Business Session of the Conference throughout the day.
On the afternoon of this day a Women's Session of the Conference is being organized.
Dinner by the President-Elect, Vice-Presidents and Members of the B.C.G.A. to the Retiring President and Members of the Edinburgh City Council.

LICENSED HOTELS:

N.B. Station Hotel, Princes Street.
Caledonian Station Hotel, Princes Street.
Royal British Hotel, Princes Street.
George Hotel, George Street.
Royal Hotel, Princes Street.
Grosvenor Hotel, Grosvenor Street.
Roxburgh Hotel, Charlotte Street.

TEMPERANCE HOTEL:

Cranston's Old Waverley, Princes Street.

There are many Private Hotels in Edinburgh, and a Guide Book giving a complete list and a short description of the various places of interest in the City will be sent to any member who applies to Mr. Jas. Jamieson at the Gas Department, 15, Calton Hill, Edinburgh. Delegates are recommended to make their hotel reservations immediately.

The full programme for the Conference is in course of preparation and will be circulated to members in due course.

Gas Cooking for Eastbourne School

Comparative Figures Favour Gas

Comparisons between the cost of gas and electric cooking were made at a recent meeting of the Eastbourne Town Council, when Councillor Wheeler asked that the matter of the cooking apparatus at the new Open-air School should be dealt with at once to avoid holding up the work.

He had received figures from the Gas Company and the Electricity Department. The purchase price of a gas cooker was £75 14s. 6d., and of an electrical cooker £91 6s. 9d. The hire charges were, respectively, £11 16s. and £5 16s. per annum, and the running costs per year, £17 10s. for gas and £60 18s. 6d. for electricity.

Alderman Miss Hudson said gas was much more suitable for the School, as cooking was required in the early morning and only for a short time each day. She moved the adoption of gas.

Councillor Watling seconded and the amendment was carried.

Councillor Bird then asked why the running costs for electricity should be so much higher than gas, for they had always been told that electricity was much cheaper for cooking purposes.

The Borough Electrical Engineer said the figures were based on the current rates for the town. He did not know on what basis the gas figures were arrived at.

Councillor Wheeler said the figures for gas were based on an actual instaliation in a school at Hailsham.

The Mayor said that with gas they would have a woman who had used it for a long time, and she did not think it wise to make her change to electricity, which was not an easy task. The cooking apparatus was only needed for one meal a day.

The Borough Surveyor pointed out that much of the cooking was boiling water, and he thought the Electrical Engineer would agree that for this gas had a definite advantage over electricity. The electricity figures were estimated, whereas the figures for gas were based on an installation in a larger school at Hailsham.

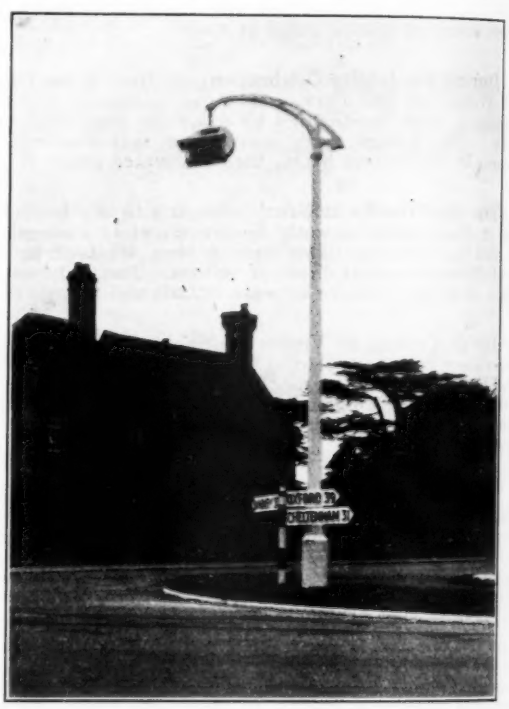
Street Lighting at Stratford-on-Avon

New Type of Lamp Standard

An interesting gas lighting installation has just been carried out by the Stratford-on-Avon Gas Department at the junction of the Banbury and Shipston Roads.

A specially designed column, with a projecting arm, about 24 ft. high, made in reinforced concrete, has been erected, and a powerful large-size "London" gas lamp of rectangular shape suspended from the arm.

The lighting power, measured 15° from the horizontal, is



The new "London" Gas Lamp at Stratford-on-Avon.

over 3,000 candles, and the new lamp affords excellent and even lighting, together with freedom from shadows, over an extremely wide area. A feature of the lamp is that diffusing glass is introduced so as to subdue the rays in certain directions, and thus even out the general roadway illumination. The lamp, which is automatically lighted and extinguished, is the first complete unit to be erected in the district. Both lamp and column were supplied by Messrs. Wm. Sugg & Co.

All the public lighting of Stratford-on-Avon is carried out by gas.

Amalgamation and Grouping

Swindon and Marlborough Undertakings.

The Swindon United Gas Company have acquired over 98% of the capital of the Marlborough Gas Company, which on and from July 1 next will come under the control of the Swindon Company. There will be a common sales policy for the whole group of Undertakings which comprises Swindon, Marlborough, Faringdon, Wootton Bassett, and Highworth, together with many outlying districts.

Mr. W. B. Claridge, the present Secretary and Manager of the Marlborough Gas Company, will join the Swindon staff as Deputy General Manager to Mr. Cecil H. Chester.

The present works staff at Marlborough will also be retained, but the Directors will retire in favour of the Swindon Directors under the Chairmanship of Major F. G. Wright.

Imperial Continental Gas Association

The Board of the Imperial Continental Gas Association have resolved:

(1) That, subject to the approval of the proprietors and the verification of the accounts by the auditors, a final ordinary dividend on the £5,600,000 capital stock be paid on June 1, 1935, for the year ended March 31, 1935, to proprietors registered in the books at the close of business on May 15, 1935, at the rate of 7% (actual), less income-tax at 4s. 6d. in the £, making with the interim dividend of 5% (actual), less income-tax, paid on Nov. 15, 1934, a dividend at the rate of 12%, less tax, for the year.

(2) That the General Meeting be held in the Cambridge Room, Great Eastern Hotel, Bishopsgate, E.C. 2, at 2.15 p.m. on Friday, May 31, 1935.

(3) That the capital stock transfer books be closed from May 16 to 29, 1935, both days inclusive.

Simon-Carves By-Product Coking Plant for India

The Tata Iron and Steel Company, Ltd., the largest iron and steel concern in India, have placed an order with Simon-Carves, Ltd., of Cheadle Heath, near Manchester, for a complete by-product coking plant to be built at their steelworks at Jamshedpur, about 150 miles from Calcutta. The value of the contract is over half-a-million pounds sterling.

The order comprises a battery of 54 "Underjet" twin-flue compound coke ovens, arranged for firing by either rich or blast furnace gas or both, and having a normal capacity of 1,300 tons of coal per day, with a maximum capacity of 1,560 tons per day.

The ovens will be arranged so that they may be extended later to give a daily throughput of 4,800 tons of coal. The by-product plant will comprise primary condensing plant, electrostatic tar precipitation, high-speed large-capacity gas exhausters, final cooling and naphthalene extraction plant. Gas boosting plant to deliver the whole of the coal gas made in the ovens to the steelworks for furnace firing, &c., will be included.

The coke ovens, which will be fired with blast furnace gas, will be 14 ft. 7 in. high, 44 ft. 7 in. long over sole, and with a mean width of 18 in., and fitted with the latest type self-sealing doors. The machinery includes electrically operated ram, coke charging car, two coke guides, coke car and locomotive, and an automatic weigh bridge for coal.

The coke screening plant will be built to screen the coke from the ovens into blast furnace and domestic sizes, the blast furnace coke being delivered either direct to the furnaces or into wagons. Messrs. Simon-Carves' contract also includes a 3,500-ton steel coal service bunker, and all foundation work.

Stockport's Jubilee Efforts

Outstanding success has been achieved by the Stockport Gas Department in taking advantage of Jubilee Week for publicity, which included the throwing open of the Gas-Works to the general public and many other interesting features.

No effort was spared to demonstrate the development of the Gas Industry, to advertise the application of gas for domestic and industrial purposes, and to emphasize the excellence of modern gas appliances. A total of 3,453 persons visited the Works during the five days, and a full explanation was given to all—who were conducted round in parties by members of the staff. It was obvious that few people had any prior conception of the improved conditions which now exist on a modern gas-works as regards labourless operation. A marquee was erected at the Works in which was staged an exhibition of up-to-date gas appliances of all types. In the Industrial Laboratory attached to the Works and at various positions upon the Works water heaters, coke fires, gas fires, switches, &c., were shown in action and explained.

An oxy-coal-gas cutting burner was demonstrated to prove that steel bars could be cut at a speed equal to that of acetylene using ordinary town gas, and with a considerable reduction in fuel costs.

In spite of the Department's ceaseless activity in advertising, some visitors stated they had seen for the first time appliances which were of particular interest to them. Others were gratified to learn that gas for steam raising, central heating, and power purposes is offered at an exceptionally low rate. The application of gas for these purposes was demonstrated.

A cup of tea and biscuits were provided in the marquee for the visitors upon their return, which formed a welcome interlude. A gay tone was introduced by the decorations, which included flags, shields, &c., a flag being hoisted to the top of the waterless gasholder, 255 ft. above the ground.

At the Department's main showroom at St. Petersgate were patriotic displays which included two beautiful photographs of Their Majesties and a painting executed locally of the exterior of the King's House; an "R.A." cooker display was presented in front of this painting. Other appliances were shown representing the part the Gas Industry plays in the furnishing of the King's House.

As this year is the centenary of the incorporation of the County Borough of Stockport, a Municipal Centenary Exhibition is also being staged, prominent features being the progress of the Municipal Departments. A comprehensive exhibition of appliances has been arranged by the Gas Department, and particular interest is shown in the ancient gas appliances which have been kindly loaned by Mr. H. E. Bloor, Engineer and Manager of the York Gas Company. These are placed alongside up-to-date appliances and have been of considerable interest to thousands of visitors, who are thus enabled to see the progress the Industry has made.

Several churches and the War Memorial were floodlighted by gas for the first time, and remarkable success has been achieved in this direction.

Refrigeration for All

Gas Light and Coke Company's Attractive Terms

"No modern home is complete without a gas refrigerator—it is as necessary as the cooker." So states the introduction of a recent publication of the Gas Light and Coke Company in connection with their refrigeration campaign in an attempt to impress the public with the fact that gas refrigeration is a necessity rather than a luxury.

The booklet is entitled "The Greatest Refrigerator Offer Ever Made," and in it the consumer is told by Mr. Therm that for half-a-crown a week (or less for the smallest model), a Freezolux gas refrigerator will be her proud possession. The Gas Light and Coke Company give with each model a five-years' guarantee, with free installation and maintenance. The convenience and advantages that the refrigerator brings to the home in addition to its value in the preservation of health are convincingly presented to the reader of the publication. Three models are briefly described—viz., the Freezolux LDA, LDB, and LJK, particular reference being made to shelf area, ice-making capacity, external finish, and overall dimensions. The cash price for any particular model and the corresponding easy terms which are paid quarterly and spread over five years are also stated. If the consumer should require any further particulars the Gas Light and Coke Company will send a representative on request to tell her all about the Freezolux gas refrigerator without putting her under any obligation.

The personal convenience of the prospective purchaser of a refrigerator has been a primary consideration in the publication of the booklet even to the provision of the folio number of the Telephone Directory where the telephone numbers and addresses of the Company's showrooms are to be found.

Willing's Press Guide, 1935*

It is with confidence based on a knowledge of the ungrudging effort and care devoted to the preparation of Willing's Press Guide that the publishers present their sixty-second edition.

For many years they have experienced a lively demand for the Guide, a demand which in view of the considerable numbers of copies sold to advertisers, advertising agents, and to authorities and traders abroad must have brought no small benefit to the newspapers, magazines, and other publications of which the Guide forms so accurate a list.

The present issue does not fail to maintain the clearness, the completeness, and the accuracy of its forerunners, and the increase in the number of new periodicals of which the publishers have been advised since publication of the previous edition alone involves an appreciable expansion of their list, the aggregate in Great Britain and Ireland now reaching a figure approximating to 7,000.

The Editor invites publishers to send him information concerning any new journals or changes in existing publications which may be made from time to time.

* Published by Willing Service Advertising, 356-364, Gray's Inn Road, W.C. 1. Price, 2s. 6d.

The Society of British Gas Industries

Presidential Address

The Annual General Meeting of the Society of British Gas Industries was held on May 15 at the Hotel Metropole, W.C. 2, under the Presidency of Sir John Cadman, G.C.M.G., D.Sc., whose Presidential Address we reproduce below.

THE PRESIDENT.

SIR JOHN CADMAN, G.C.M.G., D.Sc.

At the early age of 23, Sir John Cadman was in charge of a colliery in Stafford, which position he vacated two years later to become, in 1902, a Mines Inspector, in which capacity he undertook special research work for the Commissioner of Mines. Later he became a Professor at Birmingham University, while during the war he joined the Oil Section of the Department of Overseas Trade. The knowledge Sir John Cadman gained as a member of the Royal Commission appointed to study the Persian oil-fields led to his Chairmanship of the Anglo-Persian Oil Company, in which capacity he was largely responsible for the great engineering feat which made possible the £10,000,000 pipeline from the Iraq oil-fields to the Mediterranean. Sir John is one of the world's foremost experts on oil and coal. In 1934 he was the recipient of the Melchett Medal for research of an outstanding character involving the scientific preparation and development of the use of fuel. He is President-Elect of the Institute of Fuel.

"The Future of Gas"

by

Sir John Cadman

If I were required to choose a text for my Address to-day, I should take an extract from the Society's Rule 2 (*e*):

> "To originate and promote improvements in the law as affecting the Gas Industries, and to support or oppose alterations therein. . . ."

The Gas Industry, in common with other fuel industries, is now passing through a period which, I think, will be regarded in the future as a most important phase in its career. With gas, the past has been a period of progress. The value of research has been recognized and technical operations have improved from year to year until, to-day—so far as its framework permits—the Gas Industry is one of the most efficient sections of our national industrial life. In the economic and social spheres, also, those responsible for the conduct of gas undertakings have shown that they are appreciative of the changes that have occurred in the structure of our lives; and they have adapted themselves and their operations to the many successive developments that have occurred since gas was first utilized for the public good.

As I have said, however, an important phase has now been reached and unless vigorous action is taken and drastic measures adopted to give greater freedom, the Gas Industry, if it does not languish, will fail to make that rate of progress which it merits by its efficiency and which is demanded for the national wellbeing.

You must all know the story of the foundation of the Gas Industry—with the incorporation in 1810 of the London and Westminster Chartered Gas Light and Coke Company—and of the technical, economic, and sentimental obstacles which had to be overcome.

When we think, to-day, of the conditions under which the Gas Industry was inaugurated, we may well be surprised that its continued existence was permitted.

The necessity for safety measures—and the nature of those measures—were not understood, even by suppliers of gas. Early distribution was effected through mains made of stone. Old musket-barrels screwed together were good enough for pipes. Meters for measuring supply were unknown. Accidents, of course, were frequent; and a wall of prejudice was erected against the new illuminant. Gradually, however, defects were overcome; and within a few years the profitability of supplying gas was established. A period of cut-throat competition ensued; and the Industry generally did not establish itself on a sound basis for progress until its activities were controlled by legislation.

The various acts which were passed in the middle years of the 19th Century for the regulation of gas undertakings were admirably adapted to the circumstances of the time, and, as recently as 1907, an authority on gas wrote:

> "It is quite safe to say that no other nation has so justly and wisely legislated for its gas supply, so fairly adjusted the claim of capital to reasonable remuneration, and so effectively secured the even treatment of the public and the progressive cheapening of the supply."

To-day, however, circumstances have changed, and few of those here now would apply the same commendation to gas legislation in relation to modern gas conditions.

Early Years of Gas Lighting.

Let us consider briefly what has happened in the world of gas and what is happening in connection with other fuels.

In the early years, gas was used exclusively for the purpose of illumination—at first with those "flat-flame" burners whose merits, in comparison with other means of illumination, it is difficult for us to appreciate to-day. The "flat-flame" burner was followed by the incandescent mantle by means of which the lighting efficiency of gas was increased tenfold. For both these forms of lighting a low-pressure gas supply was essential—$\frac{1}{2}$ in. of water for flat-flame burners and $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in. for incandescent burners.

It was not until 1880 or thereabouts that the use of gas for cooking and heating commenced. It was still later that gas was consumed industrially for small heating processes; and it is only in recent years that the industrial consumption of gas has become a large-scale feature of gas operations. Even to-day, however, I think you will agree with me that the industrial use of gas represents only a small percentage of what it should be—and what it would be if extraneous factors had not imposed a restrictive framework upon development.

Between the time when gas was first introduced as an illuminant and the present day, other forms of energy for heating and for the provision of power have arisen, or have been developed from beginnings as humble as those of gas. There is, of course, electricity. Like gas, electricity began its career as a source of light. It expanded in that sphere and proceeded, also, to challenge coal and steam as a means of providing motive power and heat. To-day, we have a national electricity grid, of which the ultimate aim is the provision at almost every point in this island of a supply of cheap electricity for use as an illuminant or as a form of energy. Our consumption of electricity is increasing rapidly. Between 1929 and 1934, world consump-

tion of electricity expanded by 10%. During the same period, British consumption increased by 50%.

If one single factor had to be selected in explanation of the rapid expansion of the national supply and consumption of electricity, that factor, I think, would be the progress which has been made in high-tension generation and transmission. Not so many years ago, electricity could only be conveyed from the generating station to distant centres of distribution at a pressure of 11,000 to 66,000 volts. To-day, the grid system commonly transmits current at 132,000 volts, thereby effecting an enormous reduction in losses and minimizing the expense of transmitting apparatus. It may be mentioned in passing that the Central Electricity Board estimates that up to the end of 1934, the saving in capital investment in generating plant, arising as a direct result of the construction of the grid, has exceeded £9,000,000.

Increased efficiency in the transmission of electricity by stepping up from low to high voltages has almost a parallel in the utilization of steam. Superheated steam and turbines together have made it possible to utilize as much as 25% of the calorific value of coal in comparison with the 5% or 10% obtained earlier from reciprocating engines operated by means of relatively low-pressure steam.

Petroleum Distribution.

A further parallel to electricity is perhaps offered by petroleum and its products. When natural petroleum was first discovered, and for several years after, crude oil was transported from wells to refineries or railways by means of barrels carried by mules or floated down rivers. For five years after the war, the distribution of motor spirit in this and other countries was effected by means of cans of approximately two gallons capacity. Since, however, petroleum and most of its products are liquid, the oil industry has endeavoured wherever possible to transport oil in bulk by means of pipe-lines, tankers, and road or rail tank-wagons of considerable capacity.

The use of pipe-lines for the transport of petroleum, although it was an innovation for the petroleum industry, was in reality merely an adaptation of Gas Industry practice. There is, however, a difference. As in the case of electricity, the development of oil pipe-line practice has constantly been towards the use of higher pressures, thus giving greater efficiency. In the recently constructed great Iraq pipe-line, for example, pumping pressures average 700/800 lbs. per sq. in., and in a pipe-line in Iran at present under construction a pressure of 1,200 lbs. per sq. in. will be reached.

High pressures in the case of a liquid give greater efficiency, increased speed in transit and enhanced flexibility in operation. In the case of a fluid such as gas, the use of higher pressures carries the added advantage of compressing the fluid and making it possible, for a given service, to use pipes of smaller dimensions than those necessitated by low-pressure transmission.

In the conditions prevailing in Great Britain, I understand, it has been found that high-pressure and small mains are only justified for the conveyance of small quantities of gas over relatively long distances. Practice in the United States, however, suggests that, if British circumstances should change, it might be desirable to re-examine the question with a view to securing economies which may later be obtainable in the case of gas.

It is probable, however, that the conditions under which the Gas Industry now operates will not be greatly changed so long as the Industry is controlled by legislation which was designed to regulate activities of undertakings supplying gas solely as an illuminant.

In that branch of activity, the outcome of the contest between gas and electricity is by no means a foregone conclusion. Some people, of course, regard gas as inferior to electricity for all illumination; but I suspect that the holders of that opinion are not acquainted with such developments as the pressure gas lighting—with its remarkable daylight effect—of certain streets in London, Birmingham, and other cities. As a heating agent, however, gas is more economical in use than electricity. For certain forms of heating also, gas is much more convenient on the one hand than coal and on the other than oil. It follows, therefore, quite logically, that the future of gas lies in a wide expansion of its use as a heating agent for both industrial and domestic purposes.

Such an expansion would bring benefits to all concerned. Industry at large would secure the advantage of using the cleanest and most easily controlled of fuels. The Gas Industry would gain by the greater and more regular employment of its plant which would result from any improvement in load factor above the present average of, say, 25%.

The respective attitudes of industry in general and of the Gas Industry in particular are those of a willing buyer and a willing seller. All that is necessary is for them to meet. There, unfortunately, lies the rub, since at the moment they are debarred legislatively from the association which would be of benefit to all.

Internal Co-operation.

In time, however, that barrier will doubtless be removed. In the meanwhile, I hope that another fetter on the progress of the Industry will have been shaken off. The various units of the gas manufacturing industry, as you are aware, do not compete with one another in the same area. There is, therefore, every reason why they should co-operate whole-heartedly in respect to all matters affecting the general welfare of the Industry. In point of fact, I regret to say, there is not nearly enough co-operation among the various units. If there had been more co-operation among them in the past, the Gas Industry would probably have progressed further than it has. With more co-operation in the present and the future, the difficulties of to-day and those which will yet arise would be overcome with greater ease and more rapidity.

With legislative barriers removed and with a higher measure of internal co-operation, we shall see the Gas Industry moving progressively towards the high position to which its intrinsic merits and efficiency entitle it. Gas, which is already a national industry, may be able to control its operations nationally. For many years to come we may not attain a national gas grid comparable in scale to the present electricity grid; but I am convinced that the tendency will be towards that aim. One great result will be cheaper gas.

Other benefits also will accrue. I saw recently in a well-informed financial review the statement that:

> "The coal industry has been the backbone of our prosperity for many years, but unless something is done to increase the demand for coal, the industry will have to contract still further. To substitute coal for oil simply to benefit coal does not touch the heart of the trouble, which is to make coal more efficient than rival products."

I recommend these two sentences to the close attention of everyone interested in questions of fuel. Unfortunately, the maxim contained in the second sentence is by no means fully appreciated and the possibilities suggested by its final phrase—"to make coal more efficient than rival products"—are imperfectly apprehended.

My own opinion is that there is an ample field, not only in Great Britain but in the world as a whole, for both coal and oil. Neither need entrench upon the province of the other; and if coal needs increased outlets—as it undoubtedly does—the best medium to secure those outlets lies in a very greatly increased national consumption of gas.

Gas for Motor Vehicles.

There are, of course, many ways in which consumption of gas could be increased. One method calls for special mention not only on account of its potentialities but also because of the part which the Gas Industry has played in its investigation. I refer to the use of gas as a fuel for motor vehicles.

The application of gas to the generation of power in low-speed stationary types of internal-combustion engines is, of course, already a normal feature in the production of energy. The use of gas in high-speed internal-combustion engines is, however, a more recent development.

Considerable progress has now been made in the use of compressed gas as a fuel for the heavier types of road vehicle and most of the early technical difficulties have been overcome. Nevertheless, improvement on various lines still needs to be effected. For example, the calorific value of the gaseous fuel could well be increased; specially designed engines using the fuel injection principle might be employed; and—an almost vital factor—future legislation may provide that the weight of containers for compressed gas should be disregarded in assessing the taxation to which gas-propelled vehicles are liable.

Those sections of the Gas Industry which have conducted research into the use of gas for purposes of motor transport are particularly to be congratulated upon their activities. In undertaking research and in giving publicity to the results obtained—whether good or bad, hopeful or discouraging—they have rendered a valuable service to both coal and gas. They have, moreover, prevented the exploitation of investors which might easily have occurred if the potentialities of gaseous fuel had passed into the hands of individuals more concerned with financial gain than with scientific development. Such a service calls for recognition, and I am happy to have the opportunity of drawing public attention to it.

So much for one possible future outlet of gas. There are many others.

The use of solid coal, wherever it can be satisfactorily

replaced by gaseous fuels, is opposed to almost every scientific conception of the efficient use of raw material. The combustion of solid coal involves in the first case the transport of very large quantities of useless material, such as ash. It consumes for a relatively inferior purpose—the generation of heat—a wide range of chemical substances which are better employed as dyes, fertilizers, &c. It pollutes the atmosphere of our towns and deposits on our buildings—and ourselves—large quantities of tarry substances which, in a better order of things, would add to our wealth instead of damaging our property and costing us money to remove. It was estimated some years ago that the combustion of solid coal caused £40 millions worth of damage every year. That is a sum worth saving, and the means of saving it is to be found more in the use of gas than in any other single direction.

A Question of Economics.

The problem of efficient utilization of any fuel—particularly of coal and gas—is not, however, a simple matter of progress in the directions indicated by purely scientific fact. Unfortunately for the scientist (and, I should add, for efficiency) economics steps in at quite an early stage in the journey. In this connection, economics generally resolves itself into a matter of fuel costs at the point of consumption, modified by consequential savings or added expense in operation.

For a certain purpose, solid coal may be the cheapest fuel in terms of utilizable calories, but gas, although dearer in the same terms, may effect operational savings which render it cheaper on balance.

Nevertheless, in most cases, consequential savings cannot bridge any unduly large gap between costs on a basis of calories. Since, therefore, the scientific problem of attaining the utmost efficiency is complicated by exigencies of price, the objective of the Gas Industry should be a general—and considerable—reduction in the price of gas.

Here, again, legislation bars the way by denying the freedom of operation which is essential. Not all consumers in any given area require gas of the same calorific value or the same degree of safety in use. It should be possible for the Gas Industry to meet the different requirements of the respective consumers by charging different rates. With greater operational liberty, the Gas Industry could undoubtedly increase the national consumption of gas; and, in so doing, it would confer a benefit on all whether connected with the Gas Industry or not.

We hear from many quarters to-day that national planning is an essential to success in this highly-competitive age. Within limits, which I need not now define, I subscribe to that hypothesis; and I think that the Gas Industry might be greatly aided if some well-informed people would turn their minds to the compilation of a national plan for the Gas Industry in Great Britain. Among their self-imposed terms of reference they would, of course, include provisions for the public safety, for avoidance of undue interference with other interests, and in general for the preparation of a scheme which would be industrially practicable. Such a national gas plan might never be translated into reality. It would, however, serve as a guide or as an ideal towards which progress could be made step by step. I recommend the idea for your consideration.

Institution of Gas Engineers' Examinations

The following questions were set in the Examinations in Gas Engineering and Gas Supply, which were held on April 27 and May 4 respectively, under the Education Scheme of the Institution of Gas Engineers.

GAS ENGINEERING.

ORDINARY GRADE.

From 2 p.m. to 5 p.m.

(Two questions only in each of the three Groups should be attempted.)

GROUP A.

1. Describe briefly the details requiring attention in the control of a retort setting in order to obtain a minimum fuel consumption.
   Give an average chemical composition of (*a*) producer gas and (*b*) waste gas.
   State the type of setting concerned.
2. Sketch and describe:
   (*a*) The mouthpiece of a horizontal retort, showing the lid and the method of its adjustment or (*b*) the coke extractor of a continuous vertical retort, showing how the rate of discharge is regulated.
3. Make an outline sketch of the layout of a coke grading plant. Indicate where the various grades are separated, and state suitable size limits for each.
   Give the approximate cubic feet per ton occupied by (*a*) ungraded horizontal coke and (*b*) ungraded continuous vertical coke.

GROUP B.

4. A Works produces 72·9 therms of 540 B.Th.U. gas per ton of coal carbonized. What would be the resultant volume of the mixed gas if the quality were reduced to 490 B.Th.U. by (*a*) adding producer gas of 105 B.Th.U. per cubic foot and (*b*) adding 360 B.Th.U. carburetted water gas after extracting 2½ gallons of benzole per ton of coal?
   Assume (1) all measurements at N.T.P. and (2) for each gallon of benzole recovered, reductions in the stripped gas of (i) 12 B.Th.U. in the calorific value and (ii) 36 cu.ft. in volume.
5. Sketch a cross section of a three-bladed exhauster and explain its working and function. Explain how the exhauster speed is controlled.
6. Sketch and describe the working of an apparatus suitable for the removal of tar fog from (*a*) crude coal gas or (*b*) carburetted water gas.

GROUP C.

7. Sketch a vertical section of a steel gasholder tank, 100 ft. in diameter and 20 ft. deep, showing the gas connections.
8. Sketch and describe a station governor; explain its function and how it operates.
   What is a "safety" station governor?
9. What troubles are likely to arise through the use of (*a*) hard water or (*b*) soft water, in steam raising?
   How may these troubles be overcome?

HIGHER GRADE.

PART I., from 2 p.m. to 5 p.m.

(Two questions only in each of the two Groups should be attempted.)

GROUP A.

1. (*a*) Discuss the relative merits of internal and external producers for heating retort settings.
   (*b*) Sketch and describe an example of either and state the chief points to be observed in its design and operation.
   (*c*) Give a typical analysis of producer gas and state what percentage of excess air is indicated.
2. (*a*) State the chief physical characteristics required in refractory materials to be used for retort settings.
   (*b*) Describe a test for either (i) refractoriness or (ii) after-contraction.
   (*c*) Give typical analyses of fireclay, siliceous and silica materials, respectively.
3. (*a*) Sketch and describe a self-contained steam driven blower suitable for producing the air blast for a water gas plant.
   (*b*) Describe a suitable form of meter for measuring the air used.
   (*c*) State the approximate quantity of air required per 1,000 cu.ft. of blue water gas made.

GROUP B.

4. (*a*) Sketch and describe the setting for a battery of three Lancashire boilers and state the chief points to be observed for the prevention of heat losses.
   (*b*) What is the thermal efficiency of a boiler using breeze fuel, having a calorific value of 11,000 B.Th.U. per lb. and producing steam at 100 lb. per square inch pressure by gauge, from feed water at 60° F. at the rate of 5 lb. per lb. of fuel used, assuming that 7½% of the steam produced is to be used for feed pumps and forced draught.
   (Latent heat of steam at 100 lb. per square inch pressure, 876 B.Th.U. per lb. Temperature, 338° F.)
5. (*a*) Describe an apparatus used in the laboratory for investigating the coking properties of coal and explain how it is used.
   (*b*) State the chief characteristics required in coke to be used for domestic purposes.
   (*c*) Discuss the relative merits of coke obtained by carbonizing coal in horizontal, continuous vertical and intermittent vertical retorts, respectively.
6. (*a*) Describe an apparatus for determining the calorific value of coal and explain how it is used.
   (*b*) Give an approximate balance sheet showing what becomes of the original calorific value of the coal in the process of carbonization.

HIGHER GRADE.

PART II., from 6 p.m. to 9 p.m.

(Two questions only in each of the two Groups should be attempted.)

GROUP A.

1. (*a*) Describe the chief physical and chemical changes which take place during the condensation and wet purification of crude coal gas.
   (*b*) Explain what is meant by " free " and " fixed " ammonia as applied to ammoniacal liquor. Describe a suitable method of determination.
   (*c*) Of what use is a knowledge of the composition of ammoniacal liquor in arranging a system of wet purification?
2. (*a*) When spent oxide is used for making sulphuric acid by the leaden chamber process, what are the effects of the presence of tarry matter and ammonia in the oxide?
   (*b*) An acid maker uses spent oxide containing 6% moisture and 47% sulphur; if, during burning, only 95% of the sulphur is evolved from the oxide, calculate the weight of spent oxide required to produce 100 tons of 70% sulphuric acid, assuming the conversion efficiency to be 100% (H = 1, O = 16, S = 32).
3. (*a*) Sketch and describe a plant suitable for recovering crude benzole from straight coal gas.
   (*b*) What are the chief points to be observed in operating the plant?
   (*c*) What approximate reduction in the calorific value of the gas would result from recovering 2 gallons of 70% crude benzole per ton of coal?

GROUP B.

4. (*a*) Sketch and describe the construction of a bucket elevator, with mild steel guides, for lifting coal at the rate of 40 tons per hour.
   (*b*) Calculate the horse-power required to drive the elevator, assuming the following conditions:
   Distance between centres of end shafts = 75 ft.
   Angle of elevator with the horizontal = 60°.
   Speed of buckets = 90 ft. per minute.
   Average weight of empty buckets and chains = 70 lb. per ft. run.
   Co-efficient of friction for metal to metal = 0·15.
5. (*a*) Sketch and describe the means used to maintain a constant water level in a station wet meter.
   (*b*) The volume of gas registered as made by a station wet meter is corrected to standard temperature and pressure, saturated, while that registered as sold by the consumers' meters is not so corrected. If the average temperature at the consumers' meters were 50° F. and the average barometer pressure were 29·75 in., what percentage of unaccounted-for gas would this represent? (Aqueous vapour tension at 60° F. and 50° F. is 0·52 in. and 0·36 in. mercury, respectively.)
   (*c*) If pressure of gas in station and consumers' meters were 10 in. and 4 in. water gauge, respectively, what would be the approximate effect of this on the unaccounted-for gas?
6. (*a*) Describe the procedure you would adopt and the precautions you would take when putting a new gasholder into action or an old gasholder out of action.
   (*b*) Sketch and describe how you would arrange the connections on a gasholder with its steel tank above ground level, in order to obviate risk of the distribution system being flooded as a result of leakage of water from the tank into the inlet or outlet pipes through a defective joint.

DIPLOMA, EXAMINATION IN GAS ENGINEERING (Manufacture).

PART I., from 2 p.m. to 5 p.m.

(Four questions only should be attempted.)

1. (*a*) Discuss the advantages and disadvantages of three typical systems of coal carbonization.
   (*b*) Describe one modern system by means of fully dimensioned outline sketches and make out labour and operation schemes for starting up and completely working a 100 tons per day plant.
2. (*a*) Describe, with sketches, a water gas boiler generator with self-clinkering grate and automatic operating gear.
   (*b*) What are the advantages of, and how are gas-making costs affected by, automatic operation?
   (*c*) State briefly the results of recent investigations of the working of such a generator.
3. (*a*) Detail the power requirements—steam, electric, hydraulic, and compressed air—of a modern gas-works producing 50,000 therms per day.
   (*b*) Show diagrammatically (as a genealogical tree) the distribution of the power units detailed in (*a*).
   (*c*) Give reasons for the adoption of the different types of power specified.
4. (*a*) Show, by means of outline dimensioned sketches, a layout of a complete dry purification plant for a works of 1,000 million gross cu.ft. per annum, 75% coal gas and 25% carburetted water gas. Give reasons for your choice of the plant and auxiliaries selected; also the basis of the calculations of dimensions.
   (*b*) Describe the purifying material you would employ and state total quantity required to cover all working contingencies.
5. (*a*) Sketch and describe the construction of the top curb of either a spirally or a frame guided gasholder.
   (*b*) What forces are to be taken into account in designing this curb? State the probable maximum in each case.
   (*c*) Show graphically how to obtain the resultant force acting upon the top curb at any point.

PART II., from 6 p.m. to 9 p.m.

(Four questions only should be attempted.)

1. (*a*) What are the advantages to be gained by the amalgamation or group control of separate gas undertakings?
   (*b*) What are the chief factors to be taken into account in determining whether the absorption of a small by a large undertaking is economically sound?
   (*c*) Describe the procedure necessary for the amalgamation of two Statutory Gas Undertakings by (i) Act of Parliament and (ii) Board of Trade Order.
2. (*a*) Briefly outline the historical development of the gas engine and state the features which have contributed to its modern high efficiency.
   (*b*) Draw a hypothetical indicator diagram and prove that the efficiency of a gas engine is a function of the ratio of compression.
3. Compare the composition, use and testing of (*a*) silica, (*b*) silicious and (*c*) fireclay refractories, and enumerate any special precautions you would take in the building up and use of silica materials.
4. (*a*) Describe fully some form of certified recording calorimeter. How does it differ from others in its main features?
   (*b*) What variations from the declared calorific value are allowed by the Gas Regulation Act?
   (*c*) What is the effect of gas drying on gas quality? Explain how the gas volume correction in calorific value of the gas is determined in cases where the Gas Referees are satisfied that the gas is not saturated with water vapour.
5. Give some account of developments and modifications in Gas Engineering practice—chemical, physical, and engineering—during recent years, both constructional and process.

GAS SUPPLY.

ORDINARY GRADE.

From 2 p.m. to 5 p.m.

(Two questions only in each of the three Groups should be attempted.)

GROUP A.

1. What methods are available for joining cast-iron pipes and steel pipes, and what are their advantages and disadvantages?
2. Describe in detail how you could test for soundness a new 9 in. main, 1,200 yd. in length.
   Illustrate your answer by a numerically worked out example, using your own data.
3. Make sectional sketches in plan and elevation (approximately to scale) of a 1½ in. main cock. Summarize features you regard as important and give your reasons.

GROUP B.

4. Describe and sketch a domestic gas lighting switch. What precautions must be observed in fixing it?
5. Describe and sketch a type of gas lighting suitable for interior shop lighting.
   Give the gas consumption and characteristic polar curve. Would you recommend distance control? Give your reasons.
6. Describe and sketch (*a*) a low-pressure burner and (*b*) a gas-and-air blast burner suitable for use with gas furnaces and state their methods of working.

GROUP C.

7. Describe and sketch suitable gas equipment, with thermostatic control, for heating a small greenhouse. What assumption and calculations are necessary in order to ascertain (*a*) the maximum hourly gas rate required and (*b*) the probable gas consumption for a winter season.
8. How would you state the claims of gas to a technically-minded customer who is undecided whether to instal gas or electric appliances in a new house, to be occupied by four persons, requiring lighting units, cooker, copper, three fires, and hot water at kitchen sink, lavatory basin, and bath?
9. Describe and sketch one form of low consumption gas water heater.
   State the maximum and minimum hourly gas consumptions.
   Why is thermal insulation important with this type of heater and why is it not applied to instantaneous water heaters?

[The Questions set for the Higher Grade in Gas Supply and the Diploma Examination in Gas Engineering (Supply) will be published in next week's " JOURNAL."]

London and Southern District Junior Gas Association

Annual Business Meeting

The Annual Business Meeting of the London and Southern District Junior Gas Association was held on May 3 at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C. 1—Mr. F. C. SMITH, F.C.S. (Gas Light and Coke Company), the President, in the chair.

The ASSISTANT HON. SECRETARY (Mr. G. Gardiner, Wandsworth) read the minutes of the previous meeting, which were confirmed, after which the HON. TREASURER (Mr. H. F. G. Soar, Gas Light and Coke Company) presented the financial statement for the year 1934-35. In doing so, he remarked that this was the tenth occasion on which he had had the pleasure of presenting their "budget." The accounts, he said, which showed a balance of £246, were very satisfactory, and he would like to pay tribute to the work of their Hon. Auditor, Mr. S. C. Waldock. He went on to deal with the individual items, and, in conclusion, pointed out that the accounts were £65 up as compared with the previous year. They had had a total of 32 new members.

The PRESIDENT, in congratulating the Hon. Treasurer on the satisfactory state of their finances, emphasized that they had no intention of building up a large sum of money at the bank. The Council desired the Association to remain thoroughly solvent, with sufficient money to meet any difficult situations that might arise. Any other money would be utilized in increasing the benefits they afforded to their members.

The financial statement was unanimously adopted on the proposition of the PRESIDENT, seconded by Mr. J. M. WEBBER (Croydon).

The President's Review.

The PRESIDENT then presented his review of the activities of the Association during the past session, observing that he thought it could be said with truth that their Association had never been more active than it was to-day. Although the number of members was not always an index of the value of an association, it was the factor to be taken into account in deciding whether the Association was making the right appeal to members of the Industry. He was pleased to be able to state that their position to date was: Patrons, 14; Mon. Members, 7; Members and Associate Members, 478—making a total of 499, which represented an appreciable increase in membership during the year. In addition, they had 69 student members. Their financial position was satisfactory, and in his opinion the standard of the Papers read and addresses presented to the Association during the past year had been such as to enhance the prestige of their organization. Indeed, the platforms of the Junior Gas Associations throughout the country were becoming more and more recognized in the Gas Industry.

Mr. Smith went on to refer with pleasure to the continuous stream of applications for membership, and the high qualifications of some of those applying was indicative of the importance these men attached to their Association. He also referred to the formation of the student membership class. Already some 69 students had availed themselves of this opportunity, and he was pleased to be able to say that this innovation had received the hearty support of principals of some of their leading technical institutes.

Outstanding Papers.

In referring to the various visits that the Association had made during the session and to the Papers presented at their meetings, the President mentioned that the Paper by Mr. S. F. Dunkley on "Standardization and Control of Quality" attracted perhaps the largest audience in the history of the Association. Reference was made to this Paper in the Engineering Supplement of *The Times* and in all the leading technical engineering papers in the country, while it was also abstracted in the Technical Press in Germany, the United States of America, Switzerland, and Russia, while they might be interested to learn that one large firm in Germany sent representatives to England to inquire into the system outlined in the Paper. Mr. T. G. Noble's Paper on "The Design of Gas-Fired Water Heaters" had also been very carefully considered by manufacturers of water heaters, and they were likely to see incorporated in these heaters features that should enhance the services and convenience obtainable from these appliances. He was pleased to be able to report that the Society of British Gas Industries' Silver Medal had been awarded to Mr. Noble for this Paper.

The President also reported that Mr. F. Graham, of the South Suburban Gas Company, had kindly consented to represent their Association at the forthcoming Conference of the Public Lighting Engineers to be held in London this year.

He acknowledged the indebtedness of the Association for the continued good work of Mr. Soar, from whom he had received every help and encouragement. He also paid special tribute to their Hon. Secretary, Mr. F. H. G. Higton, who had supported him during his term of office in every possible way. No one knew except those who came into contact with him the immense amount of work Mr. Higton did for the Association. A President's task was made easy with an Hon. Secretary of the calibre of Mr. Higton.

He would also like to take the opportunity of expressing their thanks to the Directors of the various concerns who had entertained the Association during the past year, and especially would he acknowledge the support of the Governor and Directors of the Gas Light and Coke Company and of his own Chief, Mr. Stephen Lacey. They also tendered their thanks to Dr. Long for providing the accommodation for their Council meetings and for his great interest in the Association. In conclusion, Mr. Smith asked the members to give the same support to Mr. Webber during the coming year as they had given to him, and he was confident that the Association would make progress under his Presidency.

The President's report was unanimously adopted on the proposition of Mr. H. J. RISBY (South Metropolitan), seconded by Mr. F. GRAHAM (South Suburban), who also incorporated with the motion a hearty vote of thanks to the President for his work—which Mr. SMITH briefly acknowledged.

A hearty vote of thanks to the Officers and Council for the session 1934-35 was accorded on the proposition of Mr. A. R. COWLISHAW (South Metropolitan), seconded by Mr. G. H. RODGERS (Gas Light and Coke), which was acknowledged on behalf of the Council by the PRESIDENT.

Election of New Officers.

The following Officers and Council were then elected for the year 1935-36 on the proposition of Mr. RODGERS, seconded by Mr. J. SUMMERSON (Luton):

President.—J. M. Webber (Croydon).
Senior Vice-President.—R. Summerson (Luton).
Junior Vice-President.—R. N. Le Fevre (Gas Light and Coke).
Hon. Treasurer.—H. F. G. Soar (Gas Light and Coke).
Hon. Secretary.—F. H. G. Higton (East Surrey).
Assistant Hon. Secretary.—G. Gardiner (Wandsworth).
Hon. Auditor.—S. C. Waldock (Gas Light and Coke).
Members of Council.—G. Gardiner (Wandsworth), S. H. Miles (Reading), H. W. H. Butterfield (South Suburban), H. J. Risby (South Metropolitan), P. Richbell (Croydon), H. H. Brown (Southampton), S. F. Dunkley (Gas Light and Coke), and J. Grayston (Lea Bridge)—the last two names representing new elections.

The PRESIDENT congratulated Mr. Webber upon his election to the Presidency of the Association, and also extended to Mr. Dunkley and Mr. Grayston best wishes for a happy period of service on the Council.

The following representatives to serve on the District Education Committee were then announced by the PRESIDENT:

Mr. T. H. Prater (Isle of Thanet).
Mr. J. M. Webber (Croydon).
Mr. R. Summerson (Luton).
Mr. F. H. G. Higton (East Surrey).

It was resolved, on the proposition of Mr. R. SUMMERSON, seconded by Mr. H. C. SIMS (South Metropolitan), that a letter be sent to Dr. J. N. Long, M.Sc., Principal of the Westminster Technical Institute, and also to the staff, thanking them for the help and facilities afforded to the Association, the proposer remarking that Dr. Long was a very good friend of the Association, who always made them welcome. The help which the Institute afforded them, he

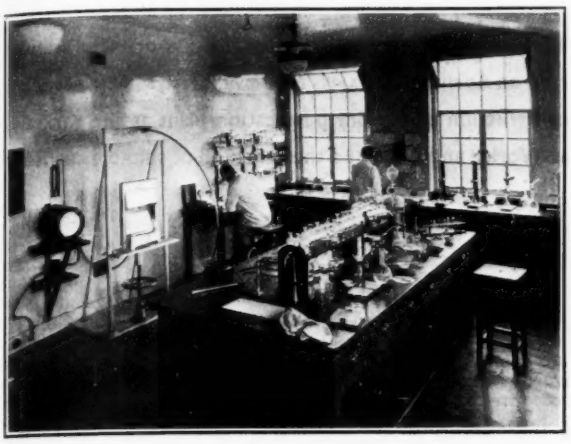
said, was enormous, and they appreciated his personal interest in their activities.

A vote of thanks to the Technical Press was accorded on the proposition of Mr. LE FEVRE, seconded by Mr. G. GARDINER, which was duly acknowledged; and after various suggestions had been received for visits and Papers for the coming session, the meeting terminated with an expression of appreciation by Mr. WEBBER of the honour the Association had done him in electing him their President for the next year.

NEW RESEARCH LABORATORIES

For Cannon Iron Foundries

In these up-to-date laboratories research work is carried out on the development of new appliances, existing apparatus is examined for alteration and improvement, and routine tests are made on materials and fittings.



The Physical Laboratory.

We referred in last week's "JOURNAL" (p. 317) to the visit of the Midlands District Gas Salesmen's Circle to the Works of Cannon Iron Foundries, Ltd., at Deepfields, near Bilston, on April 30, which occasion the firm regarded as the official opening of their new Laboratories and Research Kitchens.

The accompanying illustrations give two views of this finely equipped section of the firm's activities, which, housed in a spacious building, is in charge of the Works Chemist, Mr. W. E. Benton, and is complete with every modern device for the carrying out of research work.

Cooker Testing Laboratory.

In the cooker testing laboratory are a Boys' calorimeter and Simmance-Abady specific gravity apparatus, together with test holders. A compressor is used for obtaining high pressures for longer periods, while a third supply gives a constant pressure of 3 in. for use on low-pressure tests. Maintenance tests, to find the rate of heat loss from gas ovens, boiling tests, grilling efficiency, scorching tests are all carried out in this laboratory.

Research Kitchen.

The physical tests made in the cooker-testing laboratory do not give all the necessary information about a gas cooker. They must be supplemented by actual cooking tests under scientific conditions, and these are carried out in the fully equipped research kitchen, which is illustrated in one of our photographs.

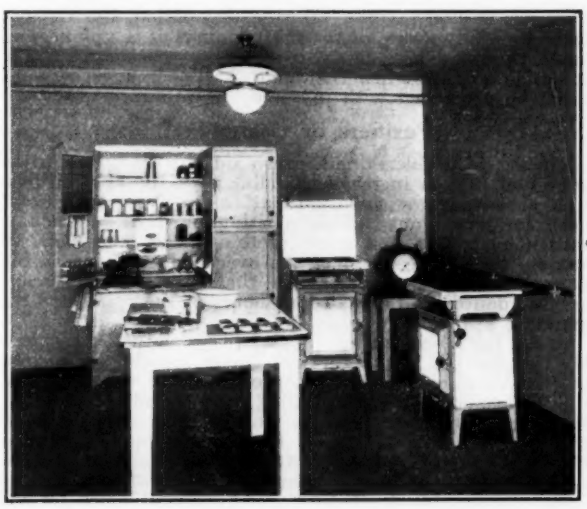
Only those foods are used which permit of exact repetition and consistency of results. Of these scones are by far the best, and Queen cakes, tea-cakes, bread, and fruit cakes follow in approximately this order of importance. Although the conditions of a cooking test cannot easily be imitated in a physical test, the results can usually be explained in scientific terms, and used as a basis for improving the design of the oven.

Physical Laboratory.

Radiant efficiency tests, gas analysis, measurement of surface temperatures, and estimation of moisture are included in the work of the physical laboratory. In the radiant efficiency test the heat radiated from the fire is measured at 81 positions (9 longitudes on each of 9 latitudes) on a hemisphere, by means of a delicate Moll thermopile. After reducing these measurements to equal areas the total heat out-put is obtained, and by comparing with the heat in-put to the fire the radiant efficiency can be calculated.

An Orsat apparatus permits of the estimation of carbon dioxide, carbon monoxide, unsaturated hydrocarbons, oxygen, methane, and hydrogen in a sample of gas. Where, however, carbon monoxide is present only in very small traces a special apparatus must be used for its measurement, employing the principle that iodine pentoxide is destroyed by carbon monoxide and liberates an equivalent amount of iodine, which can readily be estimated.

In the measurement of surface temperatures, a single thermo-junction connected to a delicate milli-voltmeter indicates the temperature of any hot surface to which it is applied. This instrument is very useful in measuring the loss of heat from radiators, &c. For the estimation of moisture, a small quantity of the substance (*e.g.*, foundry sand) is weighed out and transferred to an autoclave. A quantity of carbide is added, the autoclave sealed, and the pressure produced by the liberation of acetylene read directly on the attached manometer. This pressure is proportional to the amount of water present. The laboratory is also equipped with apparatus for various other physical and chemical tests.

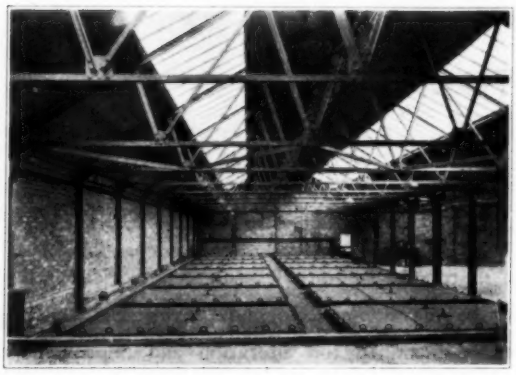


The Research Kitchen.

The lighting of the laboratories is by gas throughout.

From the foregoing brief details of the Cannon Iron Foundries' new laboratories it will be seen that they are leaving no stone unturned to produce really efficient, economical, and up-to-date gas appliances, and they will doubtless reap an early reward for their foresight and enterprise.

THE CONSTRUCTION OF



The Purifier Plant at Kirkcaldy, erected by Messrs. Henry Balfour & Co., Ltd.

Dry Purification Plant

In a Paper before the Scottish Junior Gas Association (Eastern District) on April 13, Mr. JAMES M. DOW, of Kirkcaldy, described the construction of the dry purification plant at the Kirkcaldy Gas-Works, and discussed the selection of suitable oxides.

As far back as 1912 when the Kirkcaldy Gas-Works were taken over by the Corporation the need for new purifying plant was stressed. In those days, the annual make of gas was 155 million cu.ft., while last year the annual make reached 217 million cu.ft., representing an increase of over 40%. Fortunately, the levelling-up of the winter and summer loads had helped to bridge this period, the maximum daily output having only increased from 730,000 cu.ft. in 1912 to 800,000 cu.ft. in 1934, representing only a 10% increase.

The purification plant was not the only problem the Undertaking had to solve. In 1921 the carbonizing plant caused greatest concern, and although the net capital debt on the Undertaking was in the region of £1,000 per million it was found expedient to replace the entire carbonizing plant with a 100% continuous vertical retort installation. Since then the Department, under the able guidance of its Engineer and Manager, working against odds which have called for extremely skilful handling, has reduced the capital debt from £1,200 per million in 1922 to just under £600 per million in 1934. During this period, the Department was fully aware of the shortcomings of the plant, and much time had been spent in planning schemes of reconstruction so that when the time was opportune the work could be proceeded with in correct rotation.

Purifiers or Gasholder?

These two problems had grown side by side, but in the winter of 1933-34 increasing trouble with the dry purification plant brought vividly to attention the more urgent need for new plant. Besides rising purification costs, a settlement in the east gable of the purifier house caused anxiety as to the safety of the overhead oxide preparing floor. It had to be kept in mind that our available storage only amounted to three to four hours of the maximum demand at peak load periods.

A site for a new purifier house was examined. Previous borings for the vertical retort house foundation warned us that we might be on the top of old mine workings, and the settlement in the old purifier building indicated clearly that the understrata must be treated with caution. Trial pits were sunk to a depth of 10 ft. at various points over the site, and to this depth at least we were convinced a good bed of sand existed. This appeared to be held in to some considerable depth by the old sea wall which formed the foundation of the Esplanade building line. A raft foundation suggested itself as the best means of safeguarding against the overloading of the subsoil.

Lay-Out of Plant.

The points of prime importance which had to be borne in mind in preparing the lay-out of the plant were that economy and practicability had to be the chief features in the design. Reinforced concrete was used throughout the entire foundations, floors, and retaining walls, as not only does this considerably reduce the mass of concrete, but distributes the load more evenly, carrying the foundation on a mattress and making it independent of the understrata. The purifiers were to consist of four boxes set off in a line and built to sit on the raft foundation so that the deck plates would be 2 ft. above the finished floor level. The revivifying floor would be arranged alongside the purifiers and of ample area to allow of two complete batches of oxide being prepared at the one time. No overhead floor would be built, as we felt the advantages did not warrant the expense. The tapered area at the top end of the purifiers would provide ample area for the storage of any shipment of oxide we were likely to require.

Size of Purifiers.

Applying Meade's rule for a set of four boxes a minimum of 0·5 sq. ft. per box per 1,000 cu.ft. of gas made per maximum day had to be allowed for. The area of each box, therefore, had to be not less than—

$$\frac{800{,}000 \times 0{\cdot}5}{1{,}000} = 400 \text{ sq. ft.}$$

Strange as it may seem we had actually 420 sq. ft. of area per box in our old installation, but exceptional care had to be exercised. For safe and economical working as far as the average Fife gas-making coal was concerned, this formula required a considerable margin of safety. It was therefore decided that the capacity of the new purifiers should be determined from past experience. The cubic capacity of the existing boxes working 16 in. "tiers" was 1,120 cu.ft. per box, and each box held 30 tons of oxide. Hence, if the new plant was designed to take 60 tons of oxide per box, the capacity of our purifying plant would be increased by 100%. This should prove ample for present and future requirements. Sixty tons of oxide per box would require a cubic capacity of 2,240 cu.ft., and this would be amply supplied working two 18 in. tiers in boxes measuring 30 ft. by 25 ft. by 6 ft. deep.

Features in Design of Plant.

The construction of the plant follows the general features of a set of luteless purifiers designed on Green's principle, but there are one or two features to which attention may be drawn.

(1) *The Gas Heater.*

Being fully aware of the sluggishness of different oxides at low temperatures, advantage was taken to install a preheater as near as possible to the boxes. An important point that is often overlooked when using this apparatus is that in raising the gas temperature the gas becomes unsaturated and therefore passes forward to the first box in search of moisture. This it will immediately take up from the oxide and tend to intensify the hardening-up of the active oxide. This difficulty can be overcome by fixing a calibrated steam valve at the outlet of the heater.

(2) *Reverse Flow Valve.*

With a view to securing the gas travel either upwards or downwards through the purifiers, as desired, the installation of a reverse flow valve between the inlet and outlet mains was considered. As, however, no advantage could be seen in upward flow, downward flow offered the following important advantages:

(*a*) As sulphiding would commence on the top and work down through the mass the precipitated water would pass through the oxide and assist in keeping it longer in a condition less susceptible to caking.

(*b*) Even if "caking" did take place it would in all probability commence in the top tier, so that a purifier could easily be relieved without having to empty the box.

These reasons fully convinced us that any elaboration other

than the simple downward flow connections was not required.

Sludge Fender at Outlet Valves.

The filling of the bottoms of the boxes with concrete flush with the flanges to provide a good shovelling surface resulted in the finished floor level being almost flush with the bottom seats of the outlet valves. There would therefore be a distinct possibility of sludge being carried forward and deposited on the valve seats. This might lead to the danger of passing foul gas into the outlet main. To overcome this difficulty, a 6-in. fender was fitted round the outlet port of each box.

Seal Pots.

A 4-in. cast-iron drain pipe from each box enters the base of each seal pot instead of dipping into it as is common practice. This procedure was found necessary as it was the only practicable method of fixing the seal pot in an accessible position in the pipe duct.

Gauge Panel.

The gauge panel consists of a polished slate slab measuring 4 ft. by 3 ft., to which is fixed a battery of six water tube gauges. The fittings are chromium-plated and the scales made from Ivorine. Each box has one gauge, but connections are run so that the back pressure of any tier of oxide can be individually traced. A 5% solution of glycerine in water tinted with xyzlene cyanide provides an excellent gauge liquid which resists freezing, while the blue colouration does not dirty the glass, neither is it affected by H_2S.

Oxide Handling Plant.

If an oxide handling plant was to be considered, the arrangement must necessarily be simple. One cannot but deplore how large sums of money are spent on such plants which may be in use for only one week out of the fifty-two. The system that suggested itself was to have a travelling skip running on a monorail suspended from the roof trusses. The track would be fitted with change points so that it could serve both the oxide store and the revivifying shed as well as the purifier house. The scheme seemed right on paper, but on going thoroughly into the matter the cost of strengthening the roof principals to take the load did not warrant the slight saving in manual labour that might be expected. It was considered that some portable type of handling plant would be of greater value as this might also be put to use for other works purposes, but this matter could be settled when the necessity arose.

I may add that the drawings, specifications, and schedule of quantities were prepared by the Department, the estimated cost of the scheme being £8,200, and although the final valuation has not been completed we hope to be within £100 of this figure.

The Selection of Purifying Materials.

The putting into operation of new plant always calls for revision of existing methods of working. In the old plant we had depended entirely on one oxide because it had the two essential features necessary for working under limited conditions:

(1) Under normal conditions it could be depended upon to react quickly with the H_2S.
(2) It revivified quickly either *in situ* or out of the purifier.

The capacity possibly could be improved upon, but we were prepared to sacrifice this point in favour of its assured activity.

During an extremely cold spell in January, 1934, our confidence in this material was shaken. The oxide in all boxes had become sluggish. Many suggested causes of the trouble were investigated. The air and ammonia content were both increased with little effect, and while steaming of the lutes helped to bridge the period we had a firm belief that our favoured oxide was not so active at low temperatures. The erection of the new purifiers somewhat allayed our fears of a recurrence of the trouble, but it was decided to investigate the activities of oxide under varying conditions of temperature before deciding on the material to be used in the new plant.

The results of these investigations are tabulated.

Table No. 1 shows the activities of four straight oxides. No. 2 *Oxide* in this table is the oxide we had been using in the old plant, and its activity rapidly falls off at the lower temperatures, its activity below 50° F. being practically *nil*. This result clearly confirmed the cause of the former trouble.

TABLE NO. 1.—*Straight Oxides.*

Temperature, °F.	40	45	50	55	60	65	70	75	80	85	90	95	100
1. By-product oxide	12·0	12·5	13·0	13·5	13·9	14·0	14·1	14·5	15·3	16·0	16·2	16·3	16·5
2. Synthetic oxide	..	..	0·3	1·0	2·2	3·8	4·3	6·4	6·9	7·0	7·0	7·2	7·4
3. Natural oxide	1·2	1·7	2·3	3·3	4·7	5·4	5·7	5·8	5·8	6·0	6·2	6·5	6·7
4. Partially spent oxide	1·3	1·5	1·8	2·3	2·7	3·9	4·5	4·8	5·0	5·6	5·8	6·0	6·4

TABLE NO. 2.—*Blending Nos. 3, 2, 4, and 1.*

Temperature, F.	40	45	50	55	60	65	70	75	80	85	90	95	100
75% 3 + 10% 2 + 10% 4 + 5% 1	3·4	3·6	3·9	4·3	5·0	5·7	6·1	6·4	6·8	7·3	7·8	8·2	8·5

No. 1 Oxide, a By-Product from the Aluminium Industry on the Continent, proved itself to be by far the most active oxide. As a matter of fact its intense activity led us to treat it with a certain amount of caution as too great activity usually leads to caking troubles, and there is always the danger of firing on revivification.

No. 3 Oxide is a Natural Dutch Bog Ore which, although it appears to be a little sluggish at low temperatures, shows a very even activity above 60° F.

No. 4 Oxide was a Sample of Partially Spent Oxide, containing slightly over 30% sulphur. Its inclusion is necessary, as we are desirous to work up its sulphur content. It will be noted that although this oxide was originally similar to No. 2 Oxide its activity has practically no similarity. As a matter of fact it appears to be much more active at low temperatures, and hence if blended with a sluggish oxide might assist its activity.

The blend in Table 2 gave the nearest approach to the ideal set out to gain, and it is intended to prepare our batches in the proportion of 75% of No. 3, 10% of No. 2, 10% of No. 4, and 5% of No. 1.

Discussion.

Mr. A. J. DORAN (Vice-President) said that their experience at Granton with downward flow had resulted in tar fog clogging oxide, retarding the activity, and setting up pressure; they therefore preferred upward flow. He had found that the results of analysis were not always a very reliable guide to working results, but that the percentage of organic matter was important. He asked what quantity of sulphur Mr. Dow could work up to in spent oxide and amount of tar present.

Mr. DOW said that with downward flow they could remove any tar collecting on top of oxide without the necessity of emptying the whole box, and with the system of gauges whereby the layer which was setting up excessive pressure could be traced, they did not anticipate trouble from tar. In the spent oxide, 3-5% of tar was found, and the oxide was worked up to about 40% sulphur on the dry basis.

Mr. J. KINCAID (Engineer and Manager, Kirkcaldy Gas Department) said that their first object was to sell cheap gas, and to that end expenditures had to be judiciously made, but they had further improvements in view. He complimented Messrs. Henry Balfour on their work in erecting the purifiers on a difficult site.

Mr. A. C. REA (Granton) said he was interested in the heater which had been installed to raise the gas temperature before passing to the dry purifiers. From observations made at Granton they had found that the gas temperature at their purifiers followed the average ground temperature and kept 15° F. above it. If 65° F. was taken as the minimum desirable temperature for satisfactory reactions they would require preheating for seven months in the year. Trouble was experienced with temperatures when below 50° F., and Mr. Dow's figures showed how the reaction of oxides rapidly fell away at temperatures below 60° F.

Mr. DICKSON (Cowdenbeath) commented on the fine piece of engineering under difficult circumstances, and asked if they had any experience of souring of oxide due to CO from C.W.G. plant.

Mr. DOW, in reply, said they allowed about 2 grains of ammonia per 100 cu.ft. to pass forward to the purifiers, and this kept the oxide sweet.

Mr. RICHMOND (Penicuik) thought that two 18 in. layers in a 60 in. box was a great waste of space, and suggested using deeper layers. He believed in having the last box filled with lime, as this absorbed CO_2 and kept down inerts.

Mr. DOW said they could add another tier if required, but they required room for expansion of oxide due to absorption of sulphur increasing the bulk. They mixed a little lime with their oxide and this helped to keep it sweet and open.

Eastern Counties Gas Managers' Association

Presidential Address

of

B. Clarke, of Stamford

[Spring Meeting at Stamford, May 15-16, 1935.]

THE PRESIDENT.

Mr. Bernard Clarke, who is Engineer, Manager, and Secretary of the Stamford and St. Martin's Gas Light and Coke Company, was educated at Long Eaton and Nottingham University College. Previous to his appointment to Stamford in 1927, he was Assistant to Mr. G. Stevenson, Engineer and Manager of the Long Eaton Gas Company. Mr. Clarke gained first-class honours certificates in Gas Engineering and Gas Supply, together with the Society of British Gas Industry's second prize for the final Supply Examination. He is Vice-President of the Stamford Chamber of Commerce.

In accepting the honour of your Presidency, which I sincerely appreciate, I felt sure of the tolerance of members with greater experience and the indulgence of my seniors. It is indeed generous of this Association to elect one representing a small Undertaking, and I accept the privilege as a compliment to that section of our Association who serve the Industry and community in small works.

I believe that the service to the consumer provided by the smaller undertakings contributes in no small measure to public opinion of the Gas Industry as a whole. In this respect the importance of the service of the smaller undertakings is not relative to the dimensions of their output, nor is it confined by the boundaries of their areas of supply. In large towns the public appreciation of gas is an unconscious one, but in smaller places the gas undertaking is more closely related to the community. There is a definitely personal connection, which leads me to suggest the responsibility to the whole Industry, as well as to the community, borne by small undertakings.

Holding Companies.

One hesitates to express an opinion upon the subject of amalgamations and absorption by Holding Companies, recognizing advantages under certain conditions and paying tribute to the service rendered to the Industry by notable gas-minded groups. Indirectly the movement is a compliment from the Financial World; it indicates their appreciation of our future and their assurance of our capacity to earn dividends; but the indiscriminate purchasing of small undertakings, the over-capitalizing of such undertakings to yield lower though acceptable dividends, and manœuvres to secure options with a view to profitable disposal are definitely not for the good of the Industry, the personnel engaged therein, or the public we serve. What I do feel justified in stating is that absorption by a Holding Company is not the necessary prelude to a small undertaking operating efficiently and sustaining its existence.

Unification.

The Gas Industry is a composite one, and manufacturers of plant, the producers of gas and its by-products, and the manufacturers of appliances should utilize its products. We as Gas Engineers recognize that we are excellently served by our confrères, but it must be admitted that the appliance manufacturer is called upon to produce apparatus capable of performing satisfactorily under many conditions.

Most undertakings maintain their calorific values within creditable limits of the declared value; specific gravity is fairly constant; pressure conditions at consumers' premises are legion; inerts vary very considerably; while the physical properties of gas in one town have little or no relation to those obtaining in another. Yet we all purchase the same appliances to perform the same duty.

I believe that every undertaking should strive for continuous uniformity of its gas as regards heating value, density, and pressure. May I suggest the unification of the physical properties of gas throughout the Industry, realizing how closely linked are the methods adopted in manufacture with the final problems of distribution and utilization. Competition in the past has been responsible for our present healthy condition, while the future holds greater possibilities depending on us who serve and the standard of our product.

Standard Conditions in Germany.

The German Society of Gas and Water Engineers formulated a set of recommendations for the production of so-called standard gas on German Gas-Works, and appliances were built to operate on this basis. Gas was considered to be within the standard with:

(*a*) A gross heating value of 420 to 450 B.Th.U.,
(*b*) A density not to exceed 0·5,
(*c*) The oxygen content under no circumstances more than 0·5% and if possible not more than 0·2%,

and a further development seems likely to be the application of the "Ott Index," which is ascertained with a simple Teclu burner in which the degree of opening of the primary air inlet can be read on a disc. The feature of the gas which is used to give the index is produced by the flicker of the flame, that is, the back-firing tendency. Therefore, the flame begins to strike back if the mixture of primary air and gas exceeds a certain mixing proportion. This mixing proportion is in direct connection with the combustion property value of the gas. In addition to standards of calorific value and pressure, it should be possible to assure constant composition and combustibility with a constant air-gas ratio.

Conditions in Stamford.

These general thoughts have qualified my attempt at standardization of the gas we supply in Stamford, an ideal quite incapable of being carried out under the earlier operating conditions.

Our carbonizing plant comprises five beds of eight retorts, 21 in. by 15 in. "D" section stop-end horizontal with semi-manual charging. We carbonize South Yorkshire washed nuts, and our declared calorific value is 450 B.Th.U. There is no need for me to state that correct carbonization with such plant when treating such coals would be the production of 550 to 570 B.Th.U. gas, and further it is obvious that dilution was obtained by overpulling with the many attendant evils including:

(1) Destruction of retorts.
(2) Stopped ascension pipes, pitched mains, and loss of gas.
(3) Difficulty in control of the quality of gas made.
(4) High inert content and naphthalene troubles.
(5) Arduous labour conditions.

May I add, without attempting to reflect, that an analysis of the statistics relating to carbonizing plant in use by gas undertakings reveals well over 100 works with

a declared value of under 500 B.Th.U., operating horizontal retorts only.

Under the conditions I have mentioned the analysis of the town gas we were producing averaged:

CO_2	4·0%
O_2	0·6,,
C_nH_m	2·8,, spot test, 456 B.Th.U. gross
CO	9·4,, calculated, 455·3 B.Th.U.
CH_4	23·6,, calculated sp. gr., 0·575
H_2	37·4,, inerts, 26·8%
N_2	22·2,,

The above conforms to our statutory obligation, but I failed to see the economy of manufacturing and distributing such gas, which impression I am able to confirm by subsequent experience. We are insistent in our demands for clean coal and a quality about every article we buy, yet we do not take a stand by the physical quality of the gas we sell. In the past we have been told that one therm is as good as another, but I suggest there is a clean therm and a dirty therm.

In this connection it is interesting to note the remarks of E. V. Evans and T. Campbell Finlayson. Mr. Evans in his "Cantor Lectures" (February, 1924) said that "the greatest economy was to be attained by carbonization in a tight retort, and, if dilution were needed, this should be done by admission of a carefully controlled diluent gas," and Mr. Finlayson enumerated the disadvantages which result from working continuous verticals under conditions of pull:

(*a*) Loss of therms due to combustion of gas with air in retorts.
(*b*) Shorter working cycle due to blistering of scurf.
(*c*) Increased tendency for retort leakage due to lower pressure in retort than in combustion flues. Wherever possible, pressure should be outwards from retorts to combustion flues, so that any leakage will be coal gas into combustion flues rather than combustion gases into coal gas.

Mr. Finlayson's statements apply in particular to vertical retorts, but they are fully applicable to horizontals.

Diluent Gas.

Having decided to eliminate over-pulling and produce straight coal gas in our horizontal retorts, I gave consideration to the type of diluting gas plant which would be most suitable, and in this connection I had regard to such factors as initial cost of plant, the cost of gas production, the increase in our manufacturing capacity, and the effect on the final composition of the mixed gas.

In regard to producer gas, I noted the information given by Col. W. M. Carr in his Presidential Address before the Manchester Association in 1931—"the average cost of coke used in the manufacture of producer gas amounted to 2·1d. per therm or 1·98d. per 100 cu.ft." I satisfied myself, however, that dilution by blue water gas would yield the most desirable mixed gas, and, further, I was convinced that with automatically operated plant I could produce blue water gas at a cost at least as low as the producer gas figures given above. An estimate of the cost of manufacture of B.W.G. was as follows:

	Per 1,000 Cu.Ft. of 290 B.Th.U. d.
Generator fuel—	
35 lbs. of coke at 20s. per ton (Price realized for surplus coke)	3·75
Steam—	
For generator, say, 40 lbs. at 17s. per 10,000 lbs.	0·82
Gas—	
For power, say, 1,000 cu.ft. per day at 2s. per 1,000 cu.ft.	0·20
Labour—	
For charging and clinkering generator, 2 hours per day at 1s. per hour	0·20
Maintenance—	
Average over a number of years, say	0·50
	5·47
Cost per therm	1·89d.

Surplus water was available for washing and cooling, and purification I regarded as a credit on the coal gas plant.

The effect of the varying methods of dilution on manufacturing capacity and thermal yield per ton is illustrated by the following figures:

(1) With overpulling we produced
15,100 cu.ft. of 450 B.Th.U. gas—68 therms per ton.
(2) By eliminating over-pulling our straight coal gas production was estimated at
12,380 cu.ft. of 550 B.Th.U. gas—68 therms per ton.
(3) By diluting straight coal gas with producer gas (130 B.Th.U.) the estimated yield would be
16,230 cu.ft. of 450 B.Th.U. gas—73 therms per ton.
(4) By diluting our straight coal gas with blue water gas of 290 B.Th.U. the estimated yield was
20,000 cu.ft. of 450 B.Th.U. gas—90 therms per ton.

It was therefore evident that by substituting blue water gas for the inerts obtained from over-pulling, the yield of gas from a given number of retorts would be increased by

$$\frac{100\,(20{,}000 - 15{,}100)}{15{,}100} = 32{\cdot}4\%$$

Summarizing the above figures we have:

	Per Ton of Coal Carbonized.		
	Volume.	C.V.	Therms.
Straight coal gas	12,380	550	68
,, ,, *plus* inerts	15,100	450	68
,, ,, ,, producer gas	16,230	450	74
,, ,, ,, B.W.G.	20,000	450	90

The effect on the final specific gravity of gas is also appreciable when the extent of dilution with inerts at, say, 1·08 sp.gr. producer 0·91 (50 to 60% N_2) is noted as against B.W.G. at 0·55, and bearing in mind that each 0·01 variation in the specific gravity affects the carrying capacity of the distribution system by 1·0%.

When B.W.G. can be produced as cheaply as coal gas, then I believe the case for this method of dilution is established.

Blue Water Gas Plant.

Early in 1934 we installed an automatically operated blue water gas plant by Messrs. Humphreys & Glasgow, having a rated capacity of 120,000 cu.ft. in 24 hours.

A photograph of this plant is shown in fig. 1, and, as will

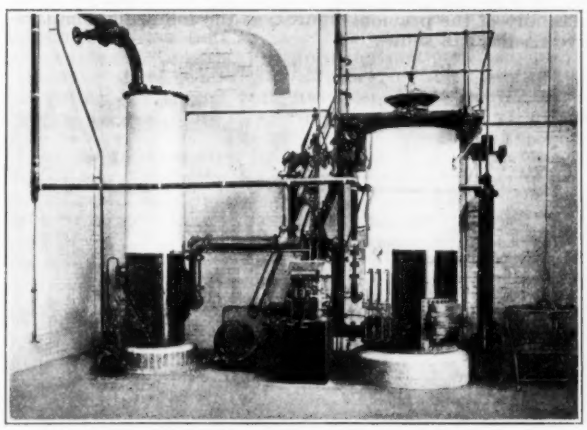


Fig. 1.

be observed, it is a very compact and conveniently arranged installation. The generator is of generous dimensions and incorporates a coke storage and drying chamber. The fire-block lining is arranged with a separate renewable inner portion over that portion where clinker is usually formed. The gas leaving the generator is washed and scrubbed in the combined vessel shown on the left of the photograph.

The automatic operator is connected to all the working valves of the plant and effects their movement in safe and proper sequence. Change can be made at will from automatic to hand operation and *vice versa*, and a safety interlocking system is included, so that in the event of a stoppage for any reason an alarm is sounded to warn the retort house stoker. A complete reverse-make system is worked in conjunction with the automatic control, and the direction of gas-making is reversed during each cycle. This ensures uniform fuel bed conditions; there is no accumulation of unburnt fuel at the base of the generator, and clinker formation is readily and easily controlled. Power for the blower and the automatic control is provided by a vertical single-cylinder gas engine supplied by Messrs. Blackstone & Co. This has proved itself to be a most reliable and highly efficient power unit.

The plant has now been in operation for nearly a year and has given me every satisfaction, both as regards reliability in working and efficiency. It is too soon to make any statement regarding upkeep costs, but I can say that to date they have been negligible. The small amount of attention which the plant requires is easily provided by the retort house stokers in the course of their ordinary duties, so that there are no extra labour charges for water gas operation. Having had some earlier water gas experience, I can testify to the amazing consistency of both quality and quantity of the gas produced in automatic plant as compared with the older type of hand-operated plant.

The plant is operated so as to ensure a uniform proportion of B.W.G. in the mixed gas. The B.W.G. enters a relief holder which happens to be available for the purpose, and is drawn back into the foul main through by-passing cocks; a retort house governor controls the conditions on the coal gas plant. I understand that it is possible, however, by means of graduated flow apparatus to work directly into the coal gas stream.

The automaticity of this type of plant and the elimination of extra labour has definitely made it possible to produce blue water gas at a cost per therm lower than our coal gas. I have no hesitation in saying that when operating this type of plant in conjunction with horizontals, even if hand charged, mixed gas can be produced at a cost comparable with that secured by any type of coal gas plant. This applies particularly to moderate-sized undertakings.

Comparison of Manufacturing Conditions and Results.

I give below the working results accurately collected for the six months July to December, 1934, of semi-manual charged horizontals with B.W.G. dilution:

Coal carbonized, tons	1,859·9
Gas made, cu.ft.	36,702,000
Gas made per ton, cu.ft.	19,733
Gas made per ton, therms	89·98
Average C.V.	456
Coke made, tons	942
Coke made per ton, cwt.	10·12
Coke gasified, tons	184·9
Coke available for sale, cwt.	8·11

My present manufacturing charges are substantially lower than any of the previous figures, as the following comparative results will show:

PERIODS JULY TO DECEMBER ONLY.

	£ s. d.	£ s. d.
1932. (No Water Gas)		
Cost of coal (all charges included)		2,815 10 11
Credit residuals—		
Coke	1,139 12 5	
Tar	327 7 2	
		1,466 19 7
Net cost of coal		£1,348 11 4
Gas made, 33,735,000 cu.ft.		
Cost per 1,000 cu.ft. (450). 9·59d.		
Cost per therm 2·13d.		
Carbonizing wages, £599 4s. 8d.		
Cost per 1,000 cu.ft. 4·26d.		
Cost per therm 0·95d.		
1933. (No Water Gas.)		
Cost of coal		2,939 2 9
Credit residuals—		
Coke	1,275 11 3	
Tar	264 8 11	
		1,540 0 2
Net cost of coal		£1,399 2 7
Gas made, 35,137,000 cu.ft.		
Cost per 1,000 cu.ft. (450). 9·55d.		
Cost per therm 2·12d.		
Carbonizing wages, £603 3s. 8d.		
Cost per 1,000 cu.ft. 4·12d.		
Cost per therm 0·92d.		
1934. (With Water Gas.)		
Cost of coal		2,348 17 3
Credit residuals—		
Coke	927 9 0	
Tar	228 9 8	
		1,155 18 8
Net cost of coal		£1,192 18 7
Gas made 36,702,000 cu.ft.		
Cost per 1,000 cu.ft. 7·80d.		
Cost per therm 1·73d.		
Carbonizing wages, £553 0s. 5d.		
Cost per 1,000 cu.ft. 3·65d.		
Cost per therm 0·82d.		

Summarizing, we have:

	Cost of Gas per 1,000 Cu.Ft.	Cost of Gas per Therm.	Carb. Wages. 1,000 Cu.Ft.
	d.	d.	d.
1932. (No water gas)	9·59	2·13	4·26
1933. (No water gas)	9·55	2·12	4·12
1934. (With water gas)	7·80	1·73	3·65

In connection with the 1934 period figures, it is of interest to note that if the prices realized for tar in 1932 had been obtained in 1934 the cost per 1,000 cu.ft. would have been reduced to 7·45d., or 1·66d. per therm. The same average prices have been paid for coal throughout.

An analysis of the working results over this period reveals the mixed gas as under:

23,073,000 cu.ft. of 548 B.Th.U.	coal gas		126,473 therms
13,629,000 ,, ,, 300 ,,	B.W.G.		40,888 ,,
36,702,000 ,, ,, 456 ,,	mixed gas		167,361 ,,

The coke gasified (184·9 tons) gives a consumption of 30·4 lbs. per 1,000 cu.ft., equal to 73,700 cu.ft. per ton, or 221 therms per ton, the actual cost of production being:

	Per 1,000 C.Ft. of 300 B.Th.U. d.
Generator fuel—	
30·4 lbs. of coke at 20s. per ton	3·26
Steam—	
40 lbs. at 17s. per 10,000 lbs.	0·82
Gas—	
8 cu.ft. per 1,000 cu.ft. made at 2s. per 1,000 cu.ft.	0·19
Labour—	
Allow 1 hour per day. (Plant working from 12 to 16 hours daily. Not extra but in place of coal gas), 1s. per 70,000 cu.ft.	0·17
Maintenance—	
This plant has not worked sufficiently long to give a definite figure, but, based on experience, 0·25d. is generous	0·25
	4·69
Cost per therm	1·56d.

The foregoing will be sufficiently convincing as to the results obtained with what is regarded as a simple type of plant. Horizontals are admittedly easy of operation, low in initial cost and maintenance, necessitating a minimum of technical supervision (still a vital factor on small works), while the availability of automatic B.W.G. plants will add to their utility and development.

Approximately 3 cwt. of coke are charged into the generator every two hours, the skip being raised to the charging floor by a steam hoist with a swinging jib crane, allowing the contents to be discharged into the generator without detaching the skip from the hoist. This operation occupies two to three minutes, while the clinkering of the fire can easily be completed in 15 minutes. The stokers have, in fact, less work to do on account of the diminished number of retorts in use, under much improved conditions.

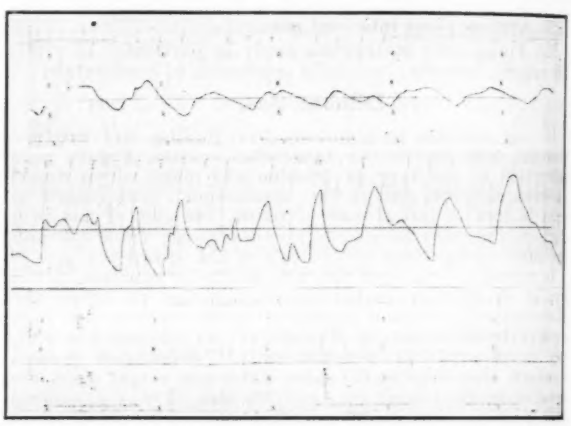


Fig. 2.

Top —Graph A.
Centre— ,, B.
Bottom— ,, C.

There are two stokers per shift, who also attend to steam boilers and clinker furnaces. Previously, when the output necessitated four beds, an additional man was introduced to clinker fires, but this labour is now eliminated. The analysis of the blue water gas produced averages:

CO_2	5·8% (includes H_2S)
O_2	0·0,,
CO	39·5,, C.V., 299 B.Th.U.
H_2	47·7,,
CH_4	1·2,,
N_2	5·8,,

We produce a very uniform quality of coke with an analysis of:

Water	4·6%
Volatile matter	1·0,,
Ash	6·2,,
Fixed carbon	88·2,,

You will appreciate the improvement in working by a consideration of the Charts reproduced.

Chart "B" (fig. 2) is from the recording calorimeter on the "Make Gas" with dilution by over-pulling, and needs no elaboration of mine on the revealed practice to reduce the calorific value down to 450 B.Th.U., and its effect on composition. Chart "A" is of "Make Gas" under conditions now obtaining—that is, the production of high-grade gas in the coal gas plant with consistent admixture of B.W.G.—and from these it will be appreciated how much more easily the calorific value of the gas to the district is

maintained within fine limits. Chart "C" is typical of town gas as distributed.

Although a specific gravity recorder is not available, daily spot tests reveal a gravity of 0·52 to 0·53 against a much higher calculated gravity obtaining under previous conditions. This reflects an increase of the order of 3% in the carrying capacity of the distribution system.

A representative analysis of town gas now being distributed is:

CO_2	3·6%	
O_2	0 3,,	
C_nH_m	1·7,,	
CO	16·8,,	Sp. Gr., 0·527
H_2	44·2,,	C.V., 450 B.Th.U.
CH_4	21·4,,	
N_2	12·0,,	

and I would, too, make mention of an experienced improvement in the reduction of organic sulphur compounds, our figure being now in the region of 25 to 28 grains per 100 cu.ft., against a much higher figure previously. Here I would express the opinion that an economical process for the elimination or reduction of sulphur compounds is the most pressing need of the Industry.

With 3,000 consumers we had only 25 naphthalene complaints within six months, while gum troubles are unknown. Most of our district troubles are due to rust, a legacy of past mal-practice, and I expect a steady improvement in this direction with a CO_2 figure at 3·6% and O_2 at 0·4%.

For a period of six months previous to the change, and for nine months afterwards, a careful census was kept of the number of complaints or requests for attention and adjustment of appliances, particularly lighting burners. This census revealed a reduction by 20·4% in number.

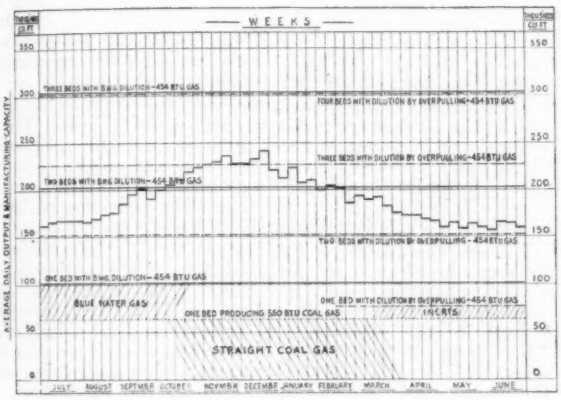

WEEKS
THOUSAND CU FT
AVERAGE DAILY OUTPUT & MANUFACTURING CAPACITY
THREE BEDS WITH 3 WG DILUTION—454 BTU GAS
FOUR BEDS WITH DILUTION BY OVERPULLING—454 BTU GAS
THREE BEDS WITH DILUTION BY OVERPULLING—454 BTU GAS
TWO BEDS WITH 3 WG DILUTION—454 BTU GAS
TWO BEDS WITH DILUTION BY OVERPULLING—454 BTU GAS
ONE BED WITH 3 WG DILUTION—454 BTU GAS
BLUE WATER GAS
ONE BED WITH DILUTION BY OVERPULLING—454 BTU GAS
ONE BED PRODUCING 550 BTU COAL GAS
STRAIGHT COAL GAS
JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY JUNE

Fig. 3.

Fig. 3 indicates graphically, for the period of a year, the average daily output per week, together with the capacity of our coal gas plant with over-pulling, and also coal gas *plus* blue water gas. Making similar allowance in respect of retorts off for cleaning, it will be seen that the daily production capacity per bed of 8 retorts with 3·3 cwt. charges over 6 hours:

with dilution by over-pulling is 75,400 cu.ft.,
or
with dilution by B.W.G. is 101,000 cu.ft.,
and further it will be noted
2 beds and B.W.G. carry the load for 9 months,
3 beds and B.W.G. carry the load for 3 months,
against
3 beds with over-pulling all the year round, with one bed extra for two months;

or, expressed in another way, the carbonizing capacity is increased by 34·5%.

It is of interest to note that the total consumption of coke on the works for the six months under consideration when operating B.W.G., used on boilers and producers, was less than the corresponding six months' consumption for boilers and producers only, accounted for by less slow firing and two beds only being in operation for part of the period.

I feel convinced by the experience as recited that blue water gas is, on account of cost and final composition, the most acceptable diluent and, further, may be utilized up to its maximum capacity, as the cost is actually cheaper per therm than straight coal gas.

Refractories.

I think it will be of interest to note that under our conditions of semi-manual charging and rakes for withdrawing coke, we experience a life of 1,500 working days with our retorts, with an estimated coal throughput of 900 tons per retort. These refractories are of local origin, being Williamson Cliff's manufacture, with the following analysis:

Silica	79·70%
Alumina	14·25,,
Ferric oxide	1·75,,
Titanic oxide	2·27,,
Lime	0·51,,
Magnesia	0·25,,
Alkalies	1·06,,

The renewals maintenance cost over a period of years has been 4·53d. per ton of coal carbonized, or 0·066d. per therm.

Coke.

As with gas, so with coke, conditions are now such as necessitate a graded fuel, and here again the refinement is equally possible to small undertakings. The coke position in this district was difficult, being affected by competition from graded and washed furnace coke and a comparatively low railway rate. We were faced also with the difficulty of storage and the necessity every summer of clearing a tonnage at low prices. In addition to the reflex advantage of B.W.G. production reducing the quantity available for sale, we installed a coke cutting and screening machine. I mention this matter, not because there is anything original in the treatment of coke, but because it is possible for practically all works to retail to the public a smokeless fuel, free from all the disadvantages of large uneven coke, at a profit for the treatment. Our machine, by Corts, of Reading, has a capacity of 5 tons per hour, with which it deals comfortably. It is of a portable type, but is, in fact, housed more or less permanently. The coke passing through cutters falls on a reciprocating tray screen, an eccentric effecting the reciprocating motion which propels the coke along, while the vibratory motion gives efficient screening. A second tray has been fitted to recover the breeze for which we have created a demand; the fines we use on our boilers. The efficient screening may be judged from the following test:

—	Large.	Nuts.	Breeze.
	%	%	%
Over 3 in.	31·6	..	..
Through 3 in. over 2½ in.	20·3	..	..
,, 2½ ,, ,, 2 ,,	8·6	..	..
,, 2 ,, ,, 1½ ,,	19·4	8·0	..
,, 1½ ,, ,, 1 ,,	8·6	45·0	..
,, 1 ,, ,, ¾ ,,	4·3	42·3	14·2
,, ¾ ,, ,, ½ ,,	2·2	3·8	77·2
,, ½ ,, ,, ¼ ,,	1·4	0·3	6·7
,, ¼ ,, ,, ⅛ ,,	1·2	0·6	1·3
,, ⅛ ,,	2·4	..	0·6

We find the standard size of ¾ in. to 1½ in. as the most acceptable grading for domestic use, and we could quite readily find a sale for the whole of our output as graded coke. We also make a feature of selling coke nuts in paper bags at 4d. per quarter, which is appreciated by the small consumer.

Distribution Matters.

As previously mentioned, the relation of the gas undertaking to the consumer in a small town is a very personal and intimate matter, and anything approaching unsatisfactory service quickly reverts to the manager of the undertaking. I am aware that much dissatisfaction with gas is due to the fact that sufficient of that commodity is not available. There could still be considerable development in output if more attention were given to the simple fundamental of adequate pressure at all consumers' meters.

May I be permitted to reproduce two district pressure charts (fig. 4) which are taken from the most unfavourable

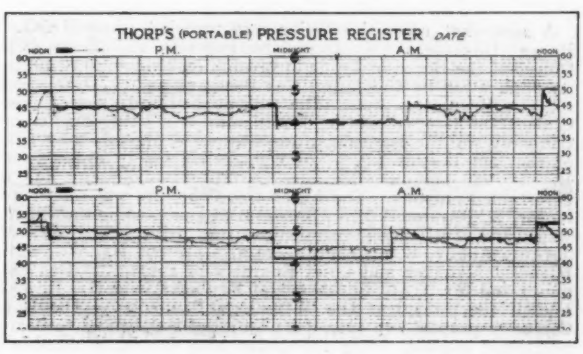


Fig. 4.

parts of our district and are proof that every part of the town is adequately served. At both these spots the pressure was at one time depleted to 2 in. at peak demand period. Many reflections on gas appliances are due, not to faulty manufacture, but rather to the inadequacy of the supply system.

I believe the most serious deterrent to the expansion of appliances, and one which retards progress in the field of flueless heaters of all types, is that of the "products of combustion." The elimination of the sulphur compounds is the most pressing problem of the Industry. We can mitigate the difficulty by taking care that appliances shall not be fixed in such a way as to cause reflection on gas as a fuel, but when these compounds can be eliminated we may visualize an expanded field for development of gas sales.

From 1927 to 1934 our sales have steadily increased by 14% in what one would call a residential and agricultural area, the industrial portion of our output being 6% to 7%. During that time the price of gas has been reduced by 24%, yet it has been our experience that a fall in price has never depleted the revenue.

With a reduction in price, an additional discount has been returned to the prepayment consumer in lieu of the increased quantity per coin. We find there is a psychological benefit in this method, in the fact that it affords a great inducement to consumers to install additional appliances. Here we have a further responsibility, in that we should exercise skill and patience in ensuring that the right type of appliance is made available, in quality, performance, and the manner of fixing. The standard of gas fitting is not always in keeping with the standard of appliance, and I have seen a good deal of fitting work reminiscent of Heath Robinson.

It is our policy to supply and fix burners, irons, switches, water heaters, and fires upon the consumer signing a slip authorizing the Meter Inspector to retain discount due; also high-grade cookers and more expensive appliances if the consumer agrees to make up the discount to the recognized hire-purchase rate. In the last four years, on this system alone, we have fitted 392 appliances, the value of which amounted to £751, and, additionally, burners, mantles, and glassware to the approximate value of £460. The consumer is accommodated, the account secure, and, moreover, the Inspectors and fitters are able with confidence to advise the replacement of obsolete fittings and to make existing ones more attractive. Further, the consumer obtains appliances which we know to be reliable instead of buying from certain sources cheap appliances, the functioning of which is not complimentary to gas.

May I be allowed to revert to my ideal of producing "constant gas"—reflecting that the domestic lighting burner is the most critical gas examiner—to stress the point that domestic lighting is more readily accepted when the adjustment bugbear is reduced or eliminated. Providing constant conditions are assured, then we may go ahead with the simplification of burners. Progress has been made, and there are several excellent single gas adjusting burners which we are using with satisfactory results.

Cookers on Hire.

On my appointment seven years ago, this Company was fixing unpacked cookers with prepayment meters. At my suggestion the policy was changed, and we have since fitted a completely packed cooker, with efficient hotplate, on a stand, with white door. I appreciate this is not the standard of some undertakings, but would reiterate that we commenced this policy seven years ago and have now installed over 1,000 among 2,743 consumers.

The cooker question is a difficult one. The consumer is entitled to an efficient appliance, and this we provide; but I believe the refinement of an all-enamel stove should be linked with ownership. This is attainable by making the hire-purchase terms as easy as possible. Ownership is the most effective barrier to a whimsical desire on the part of the consumer to try out an electric cooker.

The Water Heating Load.

The introduction of small single-point water heaters has provided a field with great possibilities, the varying types being efficient and having their particular application. The difficulty is that of the degree of water hardness. Systematic maintenance is essential, but, in my opinion, amply justified by the increased consumption. We have pushed the sale of these appliances, fitted at an inclusive cost with chromium-plated fittings, on easy hire-purchase terms. I have taken a fully representative number of cases and checked up the consumption over a full year prior to water appliances being installed and after. It is rather surprising to find the analysis revealed an average increase in the consumption of 32%.

This is an occasion when tribute may justly be given to our National Bodies, particularly the officials and personnel of those organizations. Their assistance and guidance are valuable and are worthy of an expression of appreciation recognizing the service they render.

I would like also to acknowledge the stimulating help which the Industry receives from the Technical Press, which joins in a common desire to promote the prosperity of gas and provide the medium for transmitting experiences mutually beneficial by which the Industry is so closely linked together. We have the privilege of being served by a virile intelligent Technical Press.

I trust this Address has not given the impression of egotism—for that is not the spirit in which experiences are given—but rather with a feeling of one who prizes the prestige and responsibility of the small undertakings who benefit by the experience of others, and who feels confident of the future success of the Industry, if we who are responsible for its welfare create a vision and strive with the camaraderie which exists to justify our existence.

In conclusion, I desire to record the thanks I owe my Chairman and Directors for their support and for making possible my acceptance of this Office, and again to you, gentlemen, for the honour, which I prize, and your kindly acceptance of this Address.

Luton Gas Company's Draft Order

Board of Trade Inquiry

A somewhat unusual position was revealed when Mr. J. F. Ronca (Director of Gas Administration) held an inquiry at the Offices of the Board of Trade in London on Friday, May 10, into an application by the Luton Gas Company for an Order under the Gas Regulation Acts. The only opposition to the proposals came from two competing Companies—viz., the Biggleswade Company and the Tottenham Gas Company—the latter by virtue of the fact that it has a controlling interest in not only the Biggleswade Company but also the Hitchin Company and the Dunstable Company. The Luton Gas Company was represented by Mr. H. Royston Askew (Barrister-at-Law), while the Biggleswade and Tottenham Companies were represented by Mr. Jacques Abady, K.C. There were also present Mr. W. Phillips (General Manager and Chief Engineer of the Luton Gas Company) and Mr. H. C. Smith (Chief Engineer) and Mr. E. J. K. Fussell (Secretary) of the Tottenham Company. The Luton Company proposed to extend its limits of supply and to borrow additional capital, while the Order also confers a number of standard clauses dealing with matters of detail.

Mr. ASKEW, for the Luton Gas Company, explained that the total capital raised and borrowed by the Company to date amounted to £350,000, the gas sold last year amounted to 860 million cu.ft., and the number of consumers was 24,000. At the present time gas was being sold in Luton at 7·8d. per therm, a remarkably low price, which it was submitted was a tribute to the skill and success with which the Undertaking was being and had been managed. The Luton Company, it was further explained, had laid a 6 in. high pressure main to Toddington—which is to the north of Luton—and was supplying gas there to-day as well as to some other districts close by. North of Toddington was Ampthill, which, up to recently, had been supplied by a non-statutory company, the Ampthill Gas Company, which was established in 1849. As the high-pressure main of the Luton Company had been comparatively close to this district it was obvious that by a short extension a supply could be given to Ampthill from Luton, and therefore last year the Luton Company acquired the share capital of the Ampthill Company, and that extension of the high-pressure main had actually been laid. The Ampthill Gas-Works were, therefore, no longer being used for the manufacture of gas.

Under the present Order powers were being sought to continue this development and to include within the limits of supply of the Company the parishes of Maulden, Clophill, Flitwick, Flitton, Silsoe, Pulloxhill, and Tingrith, all in the rural parish of Ampthill. When mains had been laid from Ampthill through Clophill and down to Silsoe, the Company would have gone some distance towards the possibility of completing a ring main extending from Luton to the north and back again. Not only were there considerable centres of population at Maulden, Clophill, and Silsoe, but there was undoubtedly consumption to be supplied en route, and development in this way would considerably assist in reducing the differentials now being charged and at the same time give a supply of gas in parishes where none existed at the present time. Detailed calculations showed the possibility at once of a supply of gas in the proposed additional area at a price not exceeding 5·8d. per therm above the price charged for gas at Luton, making a total figure of 13·6d. per therm. The estimated capital expenditure arising out of the granting of the Order was, during the next ten years, £43,600, and the Company was asking to raise £24,000 additional capital with borrowing powers to the extent of 60%, making total additional capital powers of £38,400, which, together with certain unexpended capital powers, would give the Company the amount of money requisite for carrying out the proposed extensions of supply. These unexpended powers were in respect of the existing limits of supply, and the new capital powers were required for the extended limits of supply. Power was also taken under this Order to manufacture and store gas on certain lands in Ampthill, and there was no objection to this.

Passing to the opposition, Mr. Askew said the position was certainly a little peculiar. The *London Gazette* notice with regard to this Order was dated Feb. 15, 1935, and on the very same day the Biggleswade Gas Company applied for a Special Order to extend its area to cover some of the additional districts now asked for by the Luton Company, and also to add some further districts to the Biggleswade Company's area. The Luton Company sent in to the Board of Trade its representations against the proposals in the Biggleswade proposed Order on March 13, and on March 18 the Biggleswade Company sent in its representations against the Luton proposed Order. Then, on March 29, the Tottenham Company appeared on the scene and applied for an Order for exactly the same purposes as the proposed Biggleswade Order and also to acquire the Biggleswade Company, and, in addition, to acquire the Hitchin Gas Company and to extend the limits of supply of the Hitchin Company a long way to the south-east. Thus, in effect, there were two other competing Orders for the area which had been scheduled by the Luton Company, but it was necessary to point out that the Biggleswade Company was a subsidiary of the Tottenham Company in that the latter controlled the whole of the share capital of the Biggleswade Company. Another interesting feature of the position was that the Tottenham Company deposited with the Board of Trade on the same date as the Biggleswade Company objections again the Luton Order in identical terms—viz., that the inhabitants of the districts proposed to be added to the Luton area would be better served by the supply being given, in the one case by Biggleswade and in the other case by the Tottenham Company.

Effect on Inhabitants.

Speaking of the possible effect of these three proposals on the inhabitants of the districts proposed to be added to the Luton limits of supply, Mr. Askew pointed out that the charge would be 13·6d. per therm under the Luton proposals. In Biggleswade gas was being sold at 14·5d. per therm and the modest differential of 2d. per therm was asked for in the Biggleswade Draft Order, making a total of 16·5d. per therm, although he doubted very much whether this 2d. would be sufficient to cover the additional cost of supplying the added areas in question. This would mean a burden being placed upon the consumers in Biggleswade. In the Tottenham Order a differential of 5d. per therm was asked over the price now charged in Tottenham of 8·6d. per unit, making a total of 13·6d. per therm, the same as under the Luton Company's proposals, which again, said Mr. Askew, was something of a coincidence having regard to the fact that the Tottenham Company had had the Luton proposals before it for some time prior to applying for its Order. The Luton Company had received a letter from the Parliamentary Agents to the Tottenham and Biggleswade Companies saying that opposition would be withdrawn to the Luton Order if Luton deleted from its draft Order the parishes of Clophill and Silsoe and would not oppose an application to the Board of Trade for these two parishes to be included in the Biggleswade limits, and, further, would give consent to the laying of inter-connecting mains through the Luton area. That proposition, however, was rejected by the Luton Company. This proposal, it was added, was made only last week, but the effect of it, if accepted, would be to emasculate the whole scheme which the Luton Company had in view.

Mr. GEORGE EVETTS, Consulting Engineer, then gave evidence and dealt with the cost of supplying the added areas included in the Luton Draft Order. Dealing only with supplying from Ampthill to Maulden, Clophill, and Silsoe—as these parishes would be dealt with first—he said the total capital expenditure would be £29,490, of which something like £19,000 had already been spent in laying the high-pressure main to Ampthill. In arriving at the differential of 5·8d. he said he had assumed an average consumption of 12,000 cu.ft. per annum for something like 1,400 consumers at first, and had adopted a figure of 4¼% for capital charges and 1¼% for depreciation.

In cross-examination, Mr. ABADY, K.C., put the assumption to Mr. Evetts that the Hitchin, Biggleswade, and Dunstable Companies were in one hand and that a ring main was laid linking up those places and the intervening area, and suggested that that would be a more far-reaching scheme and more economical in the long run than the very much smaller scheme of the Luton Company. That, indeed, was in contemplation.

Mr. EVETTS said that, although he had not had time to study this suggestion, he should not say it was an economical scheme having regard to the great length of main along which there would be very little if any demand. There would be something like 30 miles of main along which the demand would be very thin indeed.

This concluded the case for the Luton Gas Company.

Tottenham Company's Case.

Mr. ABADY, on behalf of the Tottenham and Biggleswade Gas Companies, said that the Tottenham Company acquired a controlling interest in the whole of the ordinary share capital of the Hitchin Gas Company in October, 1933; it acquired an interest in the Stevenage Gas and Coke Company in October, 1933, and a controlling interest in the Biggleswade Company in September, 1934. The Biggleswade area included the area of a non-statutory Company called the Shefford Gas Company, but the Biggleswade Company could not previously supply in Shefford without the consent of the Shefford Company. In December, 1934, however, the Biggleswade Company purchased the Shefford Company. It was then that the Biggleswade Order was promoted, and the Tottenham Order was on the stocks at the same time, as it included the right to manufacture gas on two pieces of land and also dealt with other matters. Indeed, it was due to the time taken up in giving the necessary notices with regard to the lands that the Tottenham application had been delayed. Finally, Mr. Abady said that the Tottenham Company acquired a controlling interest in the Dunstable Gas Company in March, 1935. The Tottenham Company had, as a result of these transactions, improved the Hitchin works and had run a high pressure 3 in. main out to Shefford with interconnecting branches in certain places. Referring to the Luton Gas Company's proposals, Counsel said that there were a number of parishes in the rural district of Ampthill which the Hitchin Company could supply, but which were not included in the Luton Draft Order, and it was also the proposal of the Tottenham Order to work out towards Hockliffe and Woburn, which again were not included in the Luton proposals. In that way the Tottenham scheme contemplated developing a larger area by means of a ring main than the proposals in the Luton Order, and he submitted that it was in the best interests of the inhabitants of these parishes that the supply should be given either from Biggleswade or Hitchin over this larger area rather than that the Luton Company should have powers to supply in a few of the parishes. According to the proposals in the Tottenham Order the actual price to the consumers in these areas would be very much the same as that under the Luton proposals so far as Maulden, Clophill, and Silsoe were concerned—viz., 13·6d. per therm—and that would be the same also as adding a differential of 5d. per therm to the Tottenham price. Of the parishes included in the Luton Order the Tottenham Order would only include Maulden, Clophill, and Silsoe.

Mr. *H. C. Smith*, Chief Engineer to the Tottenham and associated Companies, said that a high pressure main had been laid between Hitchin and Biggleswade, passing through Shefford, and it would be a natural extension to carry interconnecting mains to Clophill, Maulden, and Silsoe, although there would not be any prospect of getting permission to supply in Ampthill village itself owing to the fact that the Luton Company now supplied there. The scheme contemplated was to carry a ring main eventually through Biggleswade on to Sandy round through the districts included in the Luton Company's Order across to Woburn and through Hockliffe to Dunstable. It was true that supply in Woburn depended upon consent being obtained, but if that consent was not obtained there was an alternative route for the main. Speaking of the estimated cost of providing this supply, Mr. Smith said he calculated there would be a demand in the first instance of something like 11,500,000 cu.ft. in Clophill, Maulden, and Silsoe, and the capital cost would be £19,000. He had taken 4% interest on capital, and depreciation as 1%, both of which were ¼% below the figures taken by Mr. Evetts, but he considered them sufficient because the Tottenham Company could raise its capital at 4% or less. Working on the experience of Hitchin and Stevenage, where the annual consumptions averaged 24,000 and 17,000 cu.ft. per annum respectively, he had assumed an average consumption of 15,000 cu.ft. per annum for Maulden, and 20,000 cu.ft. for Clophill and Silsoe.

It was pointed out by Mr. ASKEW in cross-examination that there was a very considerable difference between the estimates of Mr. Smith and Mr. Evetts, and it was agreed that different bases had been taken in arriving at the respective figures.

Mr. ASKEW, replying on behalf of the Luton Gas Company, said that the broad scheme which had been referred to by Mr. Abady was in an extremely fluid state. Thus, he submitted, no scheme had been placed before the Board of Trade by the Tottenham Company which would justify the Board refusing to sanction the proposed Order of the Luton Company which dealt with the obvious and natural development of that Company's Undertaking without detriment to the consumers in any other part of the area.

The inquiry then closed.

THE DEVELOPMENT OF GAS SALES

by
H. C. JACKSON

To Increase the Domestic Load

This problem, which calls for the co-operation of every individual connected with the Gas Industry, was discussed by Mr. H. C. Jackson, of the Stretford and District Gas Board, in a Paper which he read before the Manchester and District Junior Gas Association on May 1.

The B.C.G.A. is to be commended for the introduction of the Training Courses which it has established for the benefit of those connected with the Sales Section. In addition, the Education Scheme has now been extended for the training of gas fitters in the execution of their duties and relations with consumers.

I have taken the B.C.G.A. Courses together with many members of the staff of the undertaking I serve, and I can assure you that success must result from these courses of study which have been carefully prepared by experts on the subject of selling and sales organization. Those salesmen who have taken the B.C.G.A. Sales Course will readily agree that they enable us to realize faults and weaknesses and help us to appreciate how much we have to learn before we are entitled to be known as "Qualified Gas Salesmen."

Time devoted to study in the taking of these courses is usually out of business hours, and it is not unreasonable to suggest that the undertakings should assist students in the payment of their fees.

The amount of knowledge that can be obtained from organized study has, of course, definite limitations, and it is therefore the duty of the respective undertakings to continue the training locally among their own staffs in accordance with their own particular policy and organization.

Advertising and Publicity.

Advertising on a national scale is undertaken by the B.C.G.A., and while I appreciate the progress they have made during recent years I have reason to believe that local undertakings generally are not receiving full benefit from their efforts, and it would appear that much closer co-operation is necessary between the Association and local undertakings who are prepared to participate in Press advertising, also between local undertakings themselves.

The fact of the B.C.G.A. being stationed in London adds to our difficulties in this direction, and the absence of direct personal representation by members of their advertising staff tends to discourage the efforts of many undertakings in co-operating on every possible occasion in the various advertising schemes initiated by the Association.

It would appear that there is a definite need for the establishment of a Branch Office in the North, with a staff available to pay regular visits to local undertakings to study and analyze their needs, so that schemes could be adopted which would prove effective in their own particular area.

If such a branch were established in the North, co-operative advertising could be undertaken instead of the present haphazard advertising when each undertaking inserts its own advertisement in the local Press which circulates in other areas, and gives little or no return to the Industry as a whole. In fact, we often observe in our local newspapers gas advertisements from neighbouring undertakings appearing in the same issue. Surely by combined effort much more could be gained at less cost.

To illustrate my point I recently read a copy of a local newspaper which contained a full-page advertisement relative to gas and gas appliances in the modern home. No fewer than four gas undertakings inserted their own advertisements in addition to the B.C.G.A. and an appliance manufacturer. This cannot be considered economic advertising, and I think you will agree that the space occupied by this group of advertisers could have been more effectively used if each of these undertakings had on this occasion co-operated for the purpose of producing an advertisement of a much more effective character with a stronger appeal from the man-in-the-street's point of view.

The original object of the advertisement page devoted to gas was to indicate in the most convincing and practical manner the advantages of gas from the house buyer's point of view. This object was not achieved, for instead of illustrating striking examples of actual installations, &c., the space available was crowded out by the names and addresses of the various local undertakings in whose areas this paper is circulated. This occurs all too frequently, and the sooner we advertise gas by organized and co-operative methods the sooner we shall gain greater rewards from our efforts.

I suggest that the B.C.G.A. might consider the appointment of Advertising and Publicity Experts to operate if necessary in each county throughout the country. Surely the Industry has sufficient interest in advertising and other forms of publicity to warrant the engagement of such officials, who could undertake valuable work in the direction of window displays for general use among local undertakings. At present far too much of this material is obtained from appliance manufacturers whose names (only rightly) having supplied this material appear very prominently on the appliances featured.

The showroom window should be an effective means of conveying our message to the public, and it is in this direction that scope is offered for an Area Expert with the necessary qualifications to design the necessary layouts.

The services of the District Advertising and Publicity Expert could also be employed to organize co-operative representation at various exhibitions attracting visitors from districts supplied by several undertakings. As an example, I might illustrate the case of the City Hall, Manchester, where on numerous occasions exhibitions are held, such as the "Brighter Homes" and Building Trades Exhibition.

At a recent "Brighter Homes" Exhibition the Manchester Gas Department had a display stand which aroused considerable public interest. Much more publicity could have been gained for the good of the Industry as a whole if other local undertakings had co-operated in a joint stand and contributed towards the cost on this occasion.

In the case of the recent Building Trades Exhibition, however, gas was not even represented, in spite of the efforts which we claim are being made to encourage the use of gas in connection with modern building developments. It was noticeable that competitive appliances were prominently displayed by many stand holders in connection with their own particular products.

Publicity by means of cookery demonstrations has been obtained in the past. While I agree that this was well worth while, conditions have changed and these demonstrations alone are not popular to-day. I suggest that much can, and must, be done by introducing other interesting subjects in connection with public demonstrations. This cannot all be achieved locally, and assistance is eagerly awaited by the establishment of district centres to put these schemes into operation.

Showrooms.

How many of our showrooms compare favourably with those of our most attractive city stores and offer the same attraction to visitors?

Many showrooms follow the custom of the Post Office and consumers are obliged to stand for long periods when completing a transaction. This, of course, is probably because the principal function of the average showroom has been for the payment of accounts. The volume of business which can be obtained from the showrooms is obviously not appreciated by many undertakings. This is evident by the general absence of selling staff appointed for showroom duties. One generally finds that routine work occupies most of the time of the regular members of the showroom staff. A change of policy is definitely needed, and in many showrooms salesmen free from routine work could be appointed with advantage to devote their whole time to creative selling and engaging in friendly and constructive conversation with consumers.

There is a most important point to be considered in connection with obtaining the maximum advantage from showrooms, and that is hours of business. I realize and appreciate that difference of opinion will be brought to bear on this subject. I will, however, outline my views in this direction, when I feel convinced that you will agree there is reason to give this matter serious thought. Many

showrooms close at midday for lunch. This I consider is quite unnecessary, and avoidable in many instances. It curtails the service given to the consumer, which applies more forcibly where telephone communication is established.

The most important point, however, is the evening closing time. We all know that competition is keen, yet we close our showrooms at, say, 5.30 p.m. daily and at noon on Saturdays. What effect has this ruling on our business?

Many undertakings have only one showroom, others several in various districts. Many are situated in busy shopping centres. Thousands of people see our windows and are forbidden to gain entry. Their hours of business are similar to those of our showrooms, and so they never have the opportunity of inspecting our goods or conversing with our sales staff.

In reply, you may say, or think, that the housewife can enjoy this privilege, and that her decision may influence the sale. I agree that this is true, but these conditions do not apply to the sale of competitive appliances. For instance, in my own particular area electrical appliances are displayed and sold by many local electrical contractors whose shops serve as showrooms for our competitors in the sale of domestic appliances. Their hours of business comply with the Shops Act, and they must, therefore, enjoy many benefits which we could equally share if our consumers were so privileged to visit our showrooms during similar hours of business.

Co-Operation with Local Plumbers.

In addition to operating our showrooms to conform with normal shopping hours, it seems reasonable to suggest that we should enlist the co-operation of local plumbers and contractors who have available suitable shops and showrooms in which they could display and demonstrate our products. Such a venture would, of course, necessitate considerable thought, attention being given to the selection of prospects and the question of special discounts for the sale of various appliances.

Many such establishments are now selling electrical equipment which in some instances is displacing obsolete gas apparatus. The average plumber at present gains little financially from the local gas undertaking for his few efforts in selling our goods, and he is only too willing for this reason alone to sell and install competitive apparatus.

It is the duty of every undertaking to foster a spirit of goodwill with local plumbers and to encourage them in the sale of our goods. They know very little about modern gas apparatus, and gas fitting work is usually entrusted to junior members of their staff. Local plumbers must be trained if we are to obtain satisfactory workmanship and satisfied consumers.

Many of us have occasion at certain periods of the year to allocate installation work to local plumbers, and it is regrettable to realize the lack of knowledge and skill these men display in the execution of their duties. I should like to stress the importance of the gas salesman maintaining contact with each consumer from whom he has received an order until the installation has been completed in accordance with his instructions. This is particularly important in connection with work carried out by an outside contractor.

Increasing the Domestic Load.

The policy adopted by many undertakings in charging for any pipe laid in excess of a given length when installing appliances often hinders sales. I consider that wherever possible the price quoted should include all installation charges. I appreciate that this condition cannot apply to special apparatus, but in most cases the majority of appliances can be sold at an inclusive price.

Considerable progress is being made in the sale of high-grade appliances, particularly cookers. I have reason to believe, however, that in some instances the lowly cottage dwelling or workman's home is escaping our attention in our race with time, fashion, and competition. Most small consumers in old-fashioned houses have gas cookers, but thousands are still using solid fuel for their wash boilers. The gas poker is an important appliance to which very little publicity has been given. The annual consumption obtained from its use is at least equal to that of a small bedroom gas fire. It is, therefore, worthy of attention as a means of increasing the domestic gas load, and also as an immediate aid to the introduction of a coke fire and the achievement of a smokeless home. In approaching the consumer of limited income, first consideration must be given to necessities. By this statement I mean that gas should be introduced for lighting, cooking, and laundry purposes, also facilities should be provided for lighting the kitchen fire and the supply of hot water for sink use. After the installation of these necessities the consumer can be interested in fires and other appliances.

Most undertakings have attempted to secure the water-heating load in small property by installing storage type sink heaters, with thermostatic gas control; and while thousands of these heaters have been installed with very little effort on the part of the various undertakings, I am by no means certain that the policy is the best one taking a long view, as it is desirable that we should attempt to obtain the whole of the water-heating load from the outset, and not only a small part, thereby leaving the door open to our competitors.

A water heater must produce a continuous supply of hot water at the turn of a tap at a moment's notice. The average consumer is tempted to turn off the gas supply with a storage heater when hot water is not required for long intervals, and, of course, satisfactory results cannot be obtained by its intermittent use. In consequence it is not so popular as the instantaneous heater, which is rapidly displacing the low-consumption storage type sink heater.

Our competitors cannot produce an appliance to give instantaneous hot water. Why not, therefore, take full advantage of our opportunities and emphasize the merits of gas for this purpose?

New Building Developments.

At this stage I should like to outline my Undertaking's policy relating to the installation of apparatus on new building estates. Like many other undertakings, our methods of charges to builders were most unsatisfactory and detrimental to their future co-operation. The question of service charges to builders is a vexed one, particularly from the builder's point of view; and our first move was to adopt a basis of charge which could be applied to all classes of building estate.

In the past our service charges were based on the number of houses to be erected, the capital cost to the undertaking for providing the necessary supply, and the revenue obtained by the estimated gas consumption. In consequence, the service charges varied in amount on every occasion, and in many instances the charge was unreasonably high due to the short-sighted policy we then adopted of not giving consideration to additional future extensions which might proceed in close proximity to the estate then under consideration, and by not having due regard to the extent to which gas was to be employed.

Many of these builders were obtaining service at considerably lower charges from other gas undertakings in whose areas they were building.

In designing the new scale of service charges for installation of gas, it was considered that they should include for a return of 5% on the capital outlay, and that an inducement should be offered to the builder to include additional gas apparatus in his standard specification. The charge we introduced is governed by the building density and the number of appliances installed, such appliances to be installed by the builder without cost to the Undertaking.

Since the introduction of this scheme in 1933, over 150 building schemes have operated in accordance with this agreement, and on every occasion we have been successful in introducing gas and appliances on these estates.

Much of the success is due to the fact that each and every builder is charged on the same basis as his competitor. Free supplies of gas to building estates is not our policy at Stretford, in spite of very severe competition. We have faith in the service we offer, and we have been most successful in convincing the builder as to the value of this service in the sale of his houses. During the summer months we have had as many as 14 furnished show houses fully equipped with gas apparatus in our various districts, which service is greatly appreciated by the builder.

It is not the builder's task to sell gas appliances. We must do our own selling. In order to effect this we call weekly at the builders' offices to obtain the names and addresses of actual purchasers. The builders are only too pleased to co-operate in this direction, and we are now in a position to approach the purchasers before they have planned the equipment for their new homes.

We have found that many of these people are resident within a radius of a few miles of our headquarters, and we thus have the privilege of personal representation on such occasions by members of our sales staff. The volume of business resulting from such activities is well worth while, and the service we offer is greatly appreciated.

In my own area every builder is called upon at least once each week and his requirements are then ascertained and given immediate attention.

While we have district showrooms, we find these too distant for the builder to visit to inspect new appliances which, for the last eighteen months, have been delivered to his building site by a member of our sales staff to whom we have allocated a Ford 8 delivery van for this purpose. Our efforts in this direction have been most successful, and

without this service we could not have made the same progress.

We were faced with the problem of introducing coloured fires of modern design to tiled surrounds which were fitted by the builder. These surrounds varied in size, colour, and design, and it became increasingly difficult to standardize a fire for general use under these conditions. We decided, therefore, to purchase tiled surrounds complete with raised hearths from a local manufacturer built to our specification for re-sale to the builder at a competitive price. By this method we were able to select a limited range of colours to harmonize with coloured fires produced by our own spraying plant.

Many hundreds of these coloured fires complete with tiled surrounds are now being supplied to building estates at an inclusive price of £2 4s. complete. So great has been the demand for this combination that we were able to persuade the gas fire manufacturer to modify the design of the castings to allow for a concealed gas connection for the convenience of the builder's plumber who is responsible for the installation.

The completed installation is worthy of a place in the bedroom of any modern home, being pleasing in design, tasteful in colour, and in keeping with the dignity of modern furnishings.

Discussion.

Mr. L. DRONSFIELD (Oldham) was of the opinion that the opening of showrooms in the evening and on Saturday afternoon was not a success.

Mr. J. GRAHAM (Lancaster) did not agree that a Northern agent of the British Commercial Gas Association should be appointed. It would have the tendency to make local salesmen lazy and discourage initiative and new ideas. Mr. Jackson did not mention personal contact, which was a very important salesman's point. The hours during which a showroom should be open depended upon local conditions—e.g., in certain manufacturing towns, where it was common for husband and wife to go out working, then obviously the showrooms should be open in the evening. In some towns electrical undertakings would lay the necessary cable free provided the builders put in all the necessary electrical points. If the builder refused, then he had to pay for the cable, which usually cost about £15, whereas the points would cost only £12. It was obvious therefore that the builder would put in the necessary points and save £3. Many builders objected to paying for two services, but it should be pointed out that both services would eventually be required by the prospective buyer or tenant. In Lancaster there was a standard charge to the builder, for a normal service, of £2 2s. for an all gas house, with £3 if the house was wired for electric lighting. One of the reasons why plumbers did not push gas appliances was because they could get a profit of 50% on electrical equipment, but it was much smaller in the case of gas appliances and it was often cheaper to buy them direct from the gas showrooms. Enthusiastic salesmen should be obtained and allowed to devote the whole of their energy to the showroom and not to routine matters.

Mr. W. E. SAUNDERS (Manchester) inquired if Stretford allowed any commission to meter inspectors or readers for orders obtained for appliances.

Mr. JACKSON, in reply to the discussion, stated that 97% of the houses erected in the Stretford area were provided with a gas supply. Approximately 3% were all-electric, but in every case it had been ascertained that the future tenants were connected either with the electrical industry or already in possession of electrical apparatus. The commission allowed for the sale of appliances was as follows:

Sales for cash	3½%
2–3 years' hire purchase	2½ ,,
5 years' hire purchase	1½ ,,

Mr. G. W. BROUGHTON (Heywood) proposed a hearty vote of thanks to Mr. Jackson for his Paper, and this was seconded by Mr. F. A. COLLIER (Oldham).

ELECTRIC WELDING IN THE Repair and Construction of Gasholders

by H. H. HOLLIS

This abridgment of a Paper by Mr. H. H. Hollis, M.Inst.Gas E., of Oxley Engineering Co., Ltd., at a Symposium on the Welding of Iron and Steel, organized by the Iron and Steel Institute, is published by permission of the Institute. The complete Paper is obtainable from the Institute at 28, Victoria Street, S.W. 1.

In no field of industry has the electric welding process proved more useful than in its application to repairs to gasholders. This class of work—particularly when repairs are being carried out with the gasholder in service—should only be undertaken by specialists who are thoroughly conversant with the design and construction of gasholders. Careful thought on the part of those responsible for the repair as to the best method to be adopted from the safety point of view, combined with a skilled welding technique on the part of the operator, are essential for success.

In this short paper the observations made will be concerned with work carried out under the author's supervision.

Electric-arc welding on gasholders is not extensively used in Great Britain. The causes of this state of affairs are, in the author's opinion, due to:

(1) The conservatism—and in some cases prejudice—of gas engineers and public bodies.
(2) The difficulty encountered by contractors in obtaining trained men thoroughly experienced in gasholder design and with the necessary welding technique, also the contractors' reluctance to scrap machinery now in use for the fabrication of riveted gasholders.

With regard to the first cause, those of the old school of thought still refuse to discard the riveted connection. This attitude of the older men in the Industry must be appreciated. Particular mention is made of public bodies, because we have in this country the iniquitous system which allows members of gas committees and councils who are by trade butchers, drapers, grocers, &c., to overrule the gas engineer on *purely technical matters*, if he should attempt to depart from the orthodox. They either do not believe in these revolutionary ideas when electric welding is being discussed, or they are not prepared to be experimented upon. The whole situation is deplorable.

The young gas engineers, generally speaking, are fully alive to the tremendous advantages which electric welding has over riveting in carrying out repairs to old gasholders, and the construction of new gasholders and steel tanks. From the contractor's point of view the difficulty is very real. There are very few men in this country at the present time capable of training the young engineer in the designing of welded gasholders, and progress will, of necessity, be very slow. But progress is definitely assured, and many young gas engineers of to-day will live to see the passing of the riveted gasholder, which will, ere long, be considered a relic of the past.

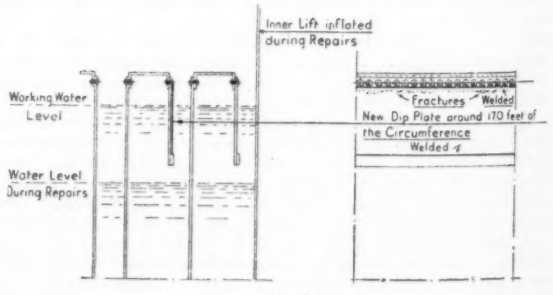

Inner Lift inflated during Repairs
Working Water Level
Water Level During Repairs
Fractures Welded
New Dip Plate around 170 feet of the Circumference Welded

Fig. 1.

The conservatism and prejudice referred to above are, it is pleasant to record, gradually being overcome, and the firm with which the author is associated has carried out extensive repairs to gasholders by welding during the last few years.

The dangers of undertaking such work without any knowledge of gasholder construction are made perfectly clear in fig. 1. Here we see the method of repairing the skirting plate on the dip of the outer lift of a three-lift gasholder. The plate, which was ¼ in. thick, was split

opposite the toe of the channel, a pocket of gas was formed between the working level of the water and the underside of the dip channel, but by virtue of the skirting plate being split at the point shown, air was mixed with the gas, forming an explosive mixture. It will be readily seen that if welding operations had commenced without removing this mixture, the consequences would have been very serious. This gas was removed from the dip by lowering the water to a few inches below the bottom edge of the dip skirting plate (as depicted in the sketch), and steaming out. About 170 lineal ft. was patched as shown.

In the case of a 62 ft. diameter gasholder crown, the old riveted sheets were cut off, and a new crown was fitted and welded in fourteen days, with the water in the tank. In connection with this work, serious corrosion was found to have taken place on parts of the top curb, under, and adjacent to, the top carriage bed-plates. The curb was brought back to its original dimensions by welding. The heavy cast iron bed-plates were dispensed with, and superseded by mild steel welded brackets. To have carried out these repairs in the orthodox manner—namely, by riveting—would have been a very long and expensive business.

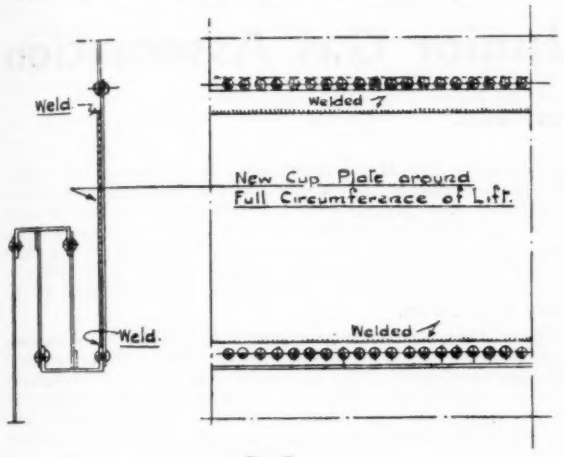


Fig. 2.

Fig. 2 shows the section of the cup and dip of a two-lift gasholder. The engineer made provision for a new cup plate to be fitted to the inner lift, by riveting in the orthodox manner, as the old plates were considerably corroded at the wind-and-water line. His intention was to pump the water out of the tank into a disused quarry about a quarter of a mile away. Eventually, these repairs were carried out by electrically welding a new plate around the periphery of the holder without removing a drop of water from the tank. It was, of course, necessary to put the holder out of commission, but only for a short time. The space between the inner lift shell and the outer lift dip skirting plates was only 3½ in., and the depth of the dip was 15 in. Welding the new plate to the toe of the cup channel was a very difficult job, but it was successfully accomplished.

In one of the largest gasholder repair contracts carried out by electric welding in this country 430 patches were welded to the side sheeting of a gasholder with a capacity of 1½ million cu.ft. The largest patch was 72 in. × 30 in., and the smallest 4 in. × 4 in. The total amount of welding was 1,568 lineal ft. The whole of the welding was carried out with the gasholder continuously in service, some of the patches being welded below the water-line in the cup. One might remark: "This gasholder should be put out of commission and re-sheeted." Certainly this should be done if circumstances would permit. The only alternative was to chance the risk of the gasholder collapsing during the time a new one was being erected. This risk was very real, as it was found that the sketch sheets adjoining the spiral rail plates had corroded for practically the full thickness of the sheet.

The last repair job to which reference is made is a most interesting one. A piece of machinery struck the gasholder and cut the side sheeting for a length of about 3 ft. The slit was ½ in. wide at the top and bottom and 2 in. wide near the centre, and at the junction of the vertical and circumferential seams. Immediately the accident occurred the holder fell until the slit was sealed in the water. The repairs were carried out in *two days*, with the holder in commission.

The time and money saved by the welding method are considerable, and of great importance to gas undertakings.

New Welded Gasholders.

The design of riveted gasholders leaves a great deal to be desired. The duties of the author take him all over this country inspecting riveted gasholders, many of which have been found to be in a deplorable and dangerous condition.

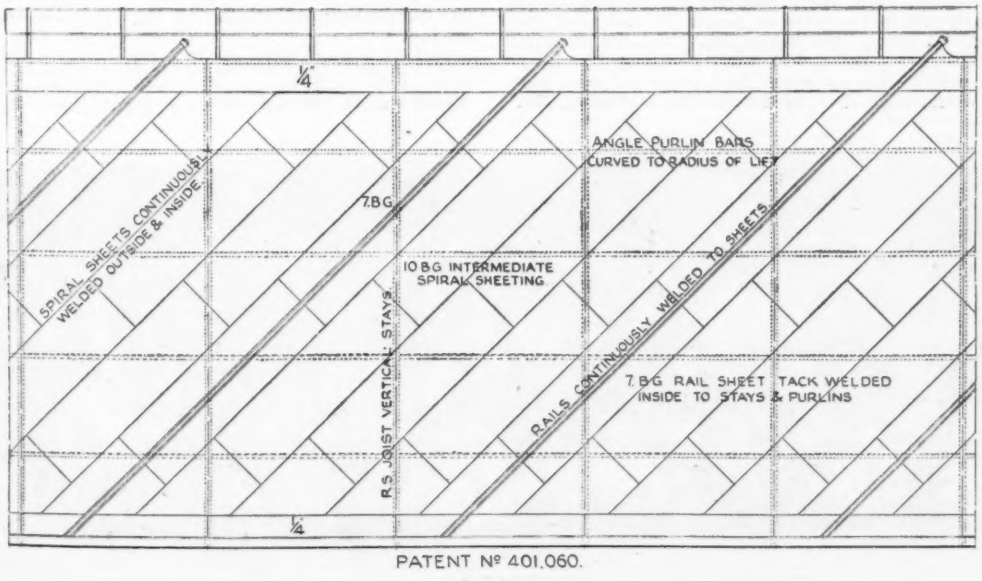
The Metropolitan Gas Company, Melbourne, started electric welding in 1920. They soon realized its advantages, and in the short space of two years they decided to construct the largest all-welded gasholder in the world, with a capacity of 3 million cu.ft. of gas.

Over 5,000 pieces of steel plating and sheeting are worked into it, and it contains about 600 tons of material. This was a colossal and magnificent undertaking, after so little experience in electric welding. Naturally, they had their difficulties. The sheeting lost its rounded shape, but the soundness of the work may be gauged by the fact that on the fifteen miles of welded seams, less than half a dozen slight "weeps" were detected.

This gasholder was followed by another of about 3 million cu.ft. capacity. The total weight of the whole structure, including the guide framing, is 760 tons. The difficulties met with on the first gasholder were overcome. The lifts on testing were found to be perfectly tight on completion, and the holder is an excellent shape.

Five large gasholders were built by the Company between the years 1922 and 1926.

The all-welded gasholder in which the author is specially interested is a very small affair in comparison with the one



PATENT Nº 401,060.

Fig. 3.

previously described—but when completed it will be the largest welded gasholder in this country. It is of the spiral guided type, and the specially designed bell (59 ft. diam. × 30 ft. deep) is shown in fig. 3. It has many advantages over the orthodox riveted type, and the strength of the welded seam is very great as compared with the strength of a riveted seam. A full fillet weld on the outside, with tack welds on the inside, produces a seam the strength of which is equal to that of the solid plate.

The seams of the design shown in fig. 3 are continuously welded both outside and inside. No jointing tape is used as in the case of the riveted design, which makes the welded gasholder ideal where oil filming is employed. The circumferential purlins shown in fig. 3 are very important. They are curved to the radius of the bell, carefully made to jigs, and fitted between the vertical stays, thereby assisting in erecting the framing true to shape. Obviously, they give added strength to the structure and there is less possibility of distortion of the bell between the vertical stays during heavy gales. They also form a framework for receiving the intermediate sheeting, which is arranged spirally—the seams being at 45°. The fillet welding on the outside is semi-downhill and on the inside semi-overhead. The spiral rails are welded to the rail sheeting continuously on both edges, another distinct improvement over the riveted type. The rail sheets are tack-welded to the framing on the inside. The advantage of this method compared with the riveted type, where the rails are only bolted to the vertical stays, is readily appreciated.

The maintenance costs for a holder of this design are considerably reduced and there are no potential leakage or corrosion points.

It is very difficult to understand why gas managers in this country appear to be so reluctant to depart from the orthodox design and construction of riveted gasholders, which have given so much trouble in the past.

Manchester and District Junior Gas Association

Visit to Stoves, Ltd.

Members of the Manchester and District Junior Gas Association visited the Works of Stoves, Ltd., on Wednesday, May 1. In the absence of the President, Mr. James Carr, Mr. H. C. Applebee (Manchester) undertook the duties of Chairman.

The Works at Rainhill, near Liverpool, cover an area of 23 acres, the buildings alone extending to 5½ acres.

The members were conducted in parties over various sections of the Works, including the moulding, fitting, testing, and painting departments. Great interest was shown in the up-to-date laboratory, where, among other things, demonstrations were given of testing gas fires for radiant efficiency, and also for ascertaining the quantity of CO present in the products of combustion. A display of the finished products of the Company was examined, and pleasure was expressed at the manner in which the Company are endeavouring to meet modern conditions, particularly in regard to colours. Cookers, fires, radiators, &c., were exhibited to meet every colour scheme.

After the inspection, the members were entertained at tea at the Fleece Hotel, St. Helens.

Mr. Alfred L. Holton (Manchester), in proposing a vote of thanks to the Directors of Stoves, Ltd., said that many members of the Association were, like himself, mainly concerned with the manufacturing side of the Gas Industry, but it is of no use manufacturing gas unless the gas is sold and used economically. During the tour of the Works, the members had seen the whole of the processes necessary for the production of a cooker. The visit that they had all so thoroughly enjoyed would enable them to go back to their respective districts and carry out their duties with greater energy and knowledge because of what they had seen that afternoon. He was not surprised to learn that 500 men were employed in the various processes and that the Works covered 23 acres. He hoped Mr. Cole, the Managing Director, would have noted with pleasure the keen interest with which the members had inspected the processes. He would also like to thank Mr. Jackson, Mr. Richardson, and Mr. Knight who had assisted in taking the parties round the works. They had all noted with admiration the products of the Company, and he trusted that they would go on from prosperity to prosperity. He therefore had pleasure in thanking the Directors for their very cordial welcome to the members of the Manchester and District Junior Gas Association, coupling with it the name of Mr. Cole.

Mr. J. Graham (Lancaster) seconded the vote of thanks, and assured the Directors of Stoves, Ltd., that they had all been surprised at the extent of the Works. Personally he was very much impressed with the lay-out and the way all the available space was used. He specially noted how economically operations were carried out in the moulding shop. The manufacturing side of the Gas Industry had realized the advantage of co-operation between the Chemist and the Engineer, and they were now recognizing the necessity of co-operation between the selling side of the Industry and the makers of gas-consuming appliances.

Mr. Cole replied on behalf of the firm, and said that they were all very pleased to have the members of the Association with them. They were not the largest Works in the country nor in the county, but it would have been observed that their output was not inconsequent. Stoves, Ltd., always welcomed suggestions and ideas, and while all could not be adopted, each one would be given definite consideration. He very much regretted the unavoidable absence of Mr. Carr, and thanked Mr. Holton and Mr. Graham for their very kind remarks.

Mr. H. C. Applebee (Manchester) made a few remarks on the Education Scheme, and urged students to arrange their course of study at the earliest opportunity, in order to avoid disappointment at the commencement of the session.

Mr. Jackson then read his Paper on "Sales Development with a View to Increasing the Domestic Load," which will be found on other pages of this issue.

Members of the Manchester and District Junior Gas Association at the Rainhill Works of Stoves, Ltd.

Cape Town and District Gas Light and Coke Company, Ltd.

Annual General Meeting

The Forty-Fifth Ordinary General Meeting of the Cape Town and District Gas Light and Coke Company, Ltd., was held at the Company's Offices, 38, Grosvenor Gardens, S.W. 1, on Friday, May 3, 1935, at 12.15 p.m.—Sir GEORGE L. BARSTOW, K.C.B. (Chairman of Directors), presiding.

The MANAGING DIRECTOR AND SECRETARY (Mr. R. W. Blackburn) read the notice convening the meeting, together with the Auditors' report on the balance-sheet.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN said: The Report and Accounts have been before you. I presume I may take them as read?

I must in the first place express my regret which I know will be shared by many shareholders that our late Chairman, Mr. C. W. Lilley—His Honour Judge Lilley as we must now call him—cannot be with us to present this Report and speak to this motion. He accepted a judicial appointment at the end of 1934, and by the rules relating to that appointment he is debarred from holding a seat on the Board of a public company. Mr. Lilley was Chairman of this Company for six years and a Director for over 30 years. He rendered very great services to the Company which owes much to his industry, judgment, and experience; but while his official connection with the Board has regretfully been severed he still retains a substantial shareholding in the Company and an interest in its activities.

My colleagues have done me the honour of electing me in his place; and while I am on these personal matters I should mention that the Board have filled one of the vacancies in their number by electing Mr. Edwin Nicholls, who has long been a substantial shareholder in the Company. Apart from his valuable personal qualifications, we felt that the shareholders would in these rather difficult times like to see on the Board a gentleman who has the best, or at least the most obvious, of reasons for working for the prosperity of the Company.

The Accounts.

I will refer briefly to the salient points of the accounts. Income from sales of gas declined (by £1,540), but improved residual sales (by £660) partly offset this. Total income is down by £850. On the other hand, reductions in expenditure were brought about to the extent of £4,300 and the balance of revenue account (at £16,834) improved by some £3,500.

After providing for debenture and loan charges, &c., there remains a balance of £2,464. This is some £1,300 better than the figure brought in from the accounts of the previous year, but is not sufficient to provide anything on account of dividends.

It must be borne in mind that the results to which I have referred have been achieved during a period of slow recovery from slump conditions and in a time of considerable disorganization which necessarily preceded our removal to new administrative offices and showrooms. These were not ready for occupation until September last.

The removal and re-organization carried out will enable administration and distribution departments to function more efficiently and will place our undertaking in a position which, we hope, will enable the severe competition to which we are subject to be more effectively countered.

The year under review has been in some ways rather disappointing. Generally speaking, in spite of very strenuous staff work, we have hardly done more than hold our own. We can, however, claim that we have done this during a particularly trying period.

I have noticed in the reports of several gas companies working in this country under more favourable conditions than our own the same story as regards volume of sales; and the explanations given here have been often the same as in our own case—partly that improved gas appliances mean a lower consumption of gas, and partly the severity of the competition with electricity and other forms of power and heating. When you consider that our electric competitor is a department of the Municipality which, if I am rightly informed, is not called upon to pay rents or wayleaves and has a monopoly for the supply of bulk electric power and public lighting, I think you will agree with me that it is a tribute to the commercial usefulness of gas that we have done as well as we have in all the circumstances.

Competition.

On this matter of competition I have two brief observations to make. One is that nothing is really sold at under cost price. If one set of ratepayers get their heating below cost you may be sure that another set of ratepayers is paying too much, either in price or by way of subsidy. And my second observation is that it is no advantage to the people of Cape Town that the development of this Company should be hampered by uneconomic competition. Gas has uninterruptedly served the community at Cape Town for over 44 years, and to-day plays an important part in the development of industry; we should be able to spend far more money in Cape Town in wages and on services if we were assured of a fair margin of profit to justify us in undertaking new developments.

Before I conclude I should like to pay a very hearty tribute to our staffs for their excellent work and for the enthusiasm they display. I regret that we found it necessary to make some reduction in salaries and wages, although I may add this was accepted in an admirable spirit of loyalty.

You will be interested to know that Mr. Blackburn, our Managing Director and Secretary, has recently returned from Cape Town, and he not only confirms what I have just said about our staffs, but brings a more encouraging report as to the improved feeling for gas and as to the efficient and up-to-date methods with which our business is conducted. I express the hope that the excellent gas service available to the community at Cape Town will be taken advantage of to a greater extent as the merits of gas become more widely recognized.

I now formally move:—

> That the Directors' Report and Statement of Accounts for the year ended Dec. 31, 1934, now presented, be and they are hereby adopted by this Meeting.

Mr. BLACKBURN, in seconding the resolution, outlined the conditions regarding the Company in Cape Town and gave a number of interesting details concerning development. The Chairman had referred, he said, to the fact that expenditure on revenue account was lessened in 1934. The reduction would have been greater but for costs necessarily incurred in expanding "gas service" to gas consumers. It was now generally recognized by the Gas Industry that the responsibility of the gas supplier could not stop at the point where gas was delivered at the consumer's meter, and that it was now more than ever necessary to provide extended service if gas goodwill was to be consolidated and maintained against competitors. He could assure them that this was specially apparent in the conditions in which their business had to operate in Cape Town. They had had to take the long view and adopt bold measures—and they had had to spend in doing this.

Mr. Blackburn went on to summarize the position as set out in a recent report to the Directors: They had now a gas organization of the first order, with ample production and standby plant, capable of producing some 1,350,000 cu.ft. of gas per day. Coal stores, boilers, engines, exhausters, condensers, scrubbers, and purifiers were capable of heavier efficient duty than was now called for, and storage capacity (holders) was ample. An increased output of 40% would entail only additional cost of coal and a slight increase in carbonizing wages, while overhead and distribution costs would fall steeply. Offices, showrooms, workshops, and stores all were now the Company's own properties with the advantage of security of tenure. They had an efficient fleet of up-to-date motor vehicles, a modernized system of departmental control working efficiently and harmoniously, and last, but not least, competent heads and staffs. He ventured to say that no other business existed in Cape Town that could be run more efficiently and with as little inside friction as gas. They were in an excellent state of preparedness to handle additional business given fair opportunity.

Working Details.

He went on to refer briefly to some facts in regard to their working and activities during the year under review. They carbonized over 15,300 tons of South African coal. They sold over 7,500 tons of coke and breeze, and over 160,000 gallons of tar and tar products. They had during the year carried through a buildings re-construction programme, providing new offices, extensive showrooms, workshops, and stores, all on the Company's own sites. They had re-modelled on efficient and up-to-date lines the whole of the administrative and distributive systems. At the same time, notwithstanding these activities, expenditure was reduced compared with the previous year by some £4,300. They sold and fixed new gas apparatus to the extent of some £7,000, and had now on rental over 3,000 gas-consuming appliances, and altogether there were in use on the district over 7,000 gas cookers, 4,500 geysers and water heaters, and 1,500 refrigerators, heating and grilling stoves, &c. There were in operation more than 146 miles of main supplying some 7,400 consumers.

The struggle for business, continued Mr. Blackburn, had been severe and must be intensified if they were to do more than hold their own against competitors . . . they must face the position; it was folly to blink the fact that by keen and efficient service only could they hope to see gas business progress against the competition it had to meet. In one direction they could claim to have progressed—gas was being brought rapidly to the front in the sphere of industrial development; and with the return to better trading conditions which were gradually coming about at Cape Town demands for gas for industry were likely still further to increase. He could say that the Company

were specially preparing to take advantage of any improvement in this regard.

He had said enough, he hoped, to show that they had been and were fully alive to the situation and he might add that all concerned in the Gas Industry at Cape Town were working wholeheartedly to better the Company's position. The outlook undoubtedly had improved; the depression which hit South Africa so hard was passing, and they now had available every possible facility for providing such a service to existing and to prospective gas consumers as would, he hoped, further tend to consolidate "goodwill for gas" and enable them to progress.

The resolution for the adoption of the Report and Accounts was then put to the meeting and carried unanimously.

Re-Appointment of Director and Auditors.

Mr. W. J. BRADFORD, J.P., moved the re-election of Sir George L. BARSTOW as a Director of the Company, remarking that it would be presumptuous on his part to attempt to praise one who held such a high position in the City of London and in its commerce. They knew—at all events, those who sat round the Board table—that Sir George was very keen on the progress of this Company and did all he could to further its development.

Mr. EDWIN NICHOLLS seconded this resolution, and observed that they were very fortunate in having Sir George Barstow to step into the place of their late Chairman.

The motion was carried unanimously, and the CHAIRMAN briefly acknowledged his re-election and assured the shareholders that he would do his best to bring this Company back to that state of prosperity which it rightly deserved.

On the proposition of Mr. FEWSTER, seconded by Mr. F. W. CRUTTENDEN, the Company's Auditors (Messrs. Kemp, Chatteris, Nichols, Sendell, & Co.) were re-appointed.

Vote of Thanks.

Mr. CRUTTENDEN, in proposing a vote of thanks to the Chairman, Directors, and staff of the Company, said that although the Directors could not recommend any dividend, they did nevertheless recognize that the Directors and staff were doing all they could for the Undertaking in very difficult circumstances. It was not for want of effort on their part that the Company was not more successful.

The vote of thanks was seconded by Mr. FEWSTER and unanimously accorded.

The CHAIRMAN acknowledged the vote on behalf of the Directors and staff, remarking that all he heard of the staff and all he knew of them confirmed the view that had just been expressed—that they were working wholeheartedly for the success of the Company.

The meeting then terminated.

Gas Tariffs

We give below a report of the discussion which followed Mr. T. P. Ridley's Paper before the North of England Gas Managers' Association, which was published fully in last week's "JOURNAL."

The PRESIDENT said that Mr. Ridley's paper was one for which they were all grateful and which required careful thought and study. He was convinced they would have to get on to gas tariffs in one form or another according to local circumstances.

Mr. J. R. BRADSHAW (Hartlepool) said the question of charges was probably one of the most important which the Industry has had to face since its inception, and the reduction in consumption per domestic consumer had given rise to much anxiety in the minds of the executives of gas undertakings. This had been particularly acute in depressed areas such as this where a large percentage of the income received for gas had its source at the unemployment exchanges. In such circumstances the problem was by no means as easy as some would have them believe. He thought there was no doubt in the minds of those executives who were still waiting for the right method of charge or discount system which was a very large selling attraction that a form of promotional tariff was desirable and essential. The reasons that something had not been done on a wide scale were many.

First of all, the Industry had for many years the idea in the back of its mind that legislation was going to do something wonderful for it. That legislation was now on the Statute Book, and whether it was satisfactory or not and whether it was all that they expected or not they did not know where they were and just how far they could go. (Mr. Ridley had referred to the minimum charge, but he doubted if any of them would have tried to operate it even if they had the power.)

Then again, the Industry had known that the Committee was working hard on a report which was going to tell them all about everything and really put them right, so they had waited for that. They had now got it and they found that it was still up to the individual undertaking to proceed on its own lines and deal with its own individual problems. Just how much was to be expected from the report he really did not know; but there it was.

He made no apology for including himself among those who were waiting for what was known as a "Lead." Now they knew they had to get down to the job themselves, and if the report made every undertaking take itself seriously to task in its method of charge and its method of increasing its consumption, then it had been well worth while, but the most important cause of hesitation and delay had undoubtedly, in this depressed area, been a pious hope that industry would so revive as to give them a chance of increasing their turnover under the existing method of charge so as to be able in any case to release a portion of their income for experimental and unestimatable losses by the introduction of an attractive tariff. Very few of them were in the position of that certain "Undertaking in an industrial area" referred to by Mr. Ridley where the question of giving some of its income away had to be considered in any case. The day of general prosperity had not arrived in this part of the country, and the bald fact was that they had waited so long for it that they could not afford to wait any longer, and they were bound to "grasp the nettle" now or continue with not only a state of decline in consumption per domestic consumer but in a large decline in total sales.

He was convinced that scientific, but not too scientific, methods of charge would lead them to increased consumption per consumer, and there was no doubt that it was consumption per consumer that mattered. The magnitude of total consumption had very little bearing relatively on the prosperity or otherwise of a gas undertaking. It used to be said that "Profits were made in the Retort House;" they still were, but it would be just as true to say that they were made in therms sold over and above the standard consumption per house.

The matter was one on which no broad lines could be laid down, but at the same time there were certain broad principles which must be applicable and which he thought might have been developed with greater clarity in the brochure recently issued. It was therefore incumbent, as Mr. Ridley had said, on each undertaking to consider its own problem, and the problem for a certain Undertaking in an industrial area on the North Bank of the Tees estuary was a three part one:

(*a*) Domestic by ordinary meter.
(*b*) Domestic by prepayment meter.
(*c*) Industrial and semi-industrial.

Dealing with domestic consumption first, he saw much charm in the two-part tariff; the consumer understood it and it did give a tremendous opportunity of meeting ½d. a unit electricity on common ground. (He was not really surprised that Mr. Ridley's earlier tariff did not take on; the commodity charge was too high.) He was aware that the two-part tariff had to be "sold," but this was a definite advantage from the fact that it could be sold at a speed which they could, to some extent, control. Those Undertakings which were just making ends meet would appreciate a means whereby the revenue that could be risked was to some extent controllable. He was, therefore, all for a two-part tariff with as low a commodity charge as possible.

Moreover, he was not in favour of a variable standing charge either on the rateable value or floor area, or room basis. He thought it would be wise to keep away from the slavish following of electricity in this. He could imagine it being a source of great irritation to the consumer from his experience of selling water rate.

It was difficult to criticize anything that came from the House of Ridley. It was a certainty to his mind that the mysterious Undertaking referred to had adopted methods of charge which suited it from a competitive point of view, but he ventured to think that if the same Undertaking had competition from electricity on the two-part tariff a different method would have been adopted.

Turning for a moment to domestic supply by slot meter he could see no hope for the two-part tariff here. The only alternative being a block tariff with a steep drop in selling prices after the economic consumption had been attained.

With regard to industrial and all other than domestic consumption he saw great possibilities in a standing charge based either on capacity of plant installed or on the assessed maximum day's consumption, together with a low commodity charge on a sliding scale. With such a tariff the small industrial consumer was catered for equally with the big one who talked in terms of millions per quarter, and, in his opinion, he was entitled to just as much consideration provided he was using gas to the full extent of his requirements.

"Before sitting down I should like to thank Mr. Ridley for his excellent Paper, which has been a great help to me and, I am sure, to us all. The whole point is that we must do something to encourage our consumers to increase their individual con-

sumptions, or we shall soon have cause to regret it. I even go so far as to say that not even the dividend must stand in the way of putting the house in order."

Mr. C. F. BLINCOE (Middlesbrough) said that the subject of tariffs was a very fascinating one. He was convinced that the day of the flat rate had gone. The future lay largely with tariffs so constructed as to give equitable terms to various classes of consumers and to secure new business at present served with other fuels. Mr. Blincoe showed how the sales of his Undertaking had increased by 120% from 1913 to 1933 and the whole of the sales had been charged at a flat rate. On closer investigation, however, while the aggregate sales had increased in later years, the average consumption per consumer had remained stationary. They had decided to introduce the block rate with special rates for large quantities of gas and for central heating systems. By breaking away from the flat rate, he thought they were preparing for the future. The new rates had only been in operation for 1½ years, but the sales up to March showed a 4% increase on the previous year and there was also an increase of 9 million cu.ft. in the sale of gas for central heating.

Mr. J. H. CURRY (Sunderland) said there were cases where the price charged for gas had been so low that there was little available surplus and an increase in the numbers of uneconomic consumers would have the effect of nullifying the basic price. They would like to adopt some form of tariff, but at present they had not sufficient surplus to tackle the problem. It would be interesting to learn how the domestic tariff averaged out so far as the ordinary consumer was concerned and to what extent he benefited and what loss there was in revenue, and how it applied in the winter and summer quarters.

Mr. H. E. BLOOR (York) remarked that the discovery of charging for electricity on a two-part tariff seemed to be the principal reason for the easy-going ways of a few years ago being banished and their becoming live business people living in a competitive world. He had to confess that it had struck him very forcibly at first when the Town Clerk of York informed him that the Corporation were to build several hundred houses for working-class people and the equipment was to be all electrical. It had always been considered that the Gas Industry was always certain of supplying the working-class home. At the present time, the population of York was in the region of 85,000 people, and he used to regard them as his population. But the Corporation had come along and housed 10,000 of them in houses where there was no gas. Those houses were in the heart of what he had considered his particular area. The day of gas as a necessity had apparently gone. He had heard the President of the B.C.G.A. say at some time that gas was a necessity in the modern home. In York they supplied relatively cheap gas and gave good service, and yet they had this new population without gas. That was made possible by the Corporation having the brainwave of determining upon a fixed charge being paid with the rent. The result was that electricity was being offered at a price which he was bound to tell them was found tolerable by the people concerned. There had been no public movement whatsoever on the part of the people to compel the Corporation to supply gas. That was an unpalatable but nevertheless true statement. Where, however, the private individual was building his house, he was overwhelmingly in favour of gas for heating and cooking. It showed that they stood not badly with the man in the street. The electricity in the 2,500 homes was only possible because of the two-part tariff system and making a fixed charge as part of the rent. The demand for gas should be encouraged by a judicious tariff. The large consumer should have some sort of tariff because complaints from a few of them could do incalculable harm to the Industry.

One of the principal things they had to do was to develop the continuous hot water load and the continuous heating of houses by gas. It would mean competing with coal and their own coke, but electricity was doing it and there were people who were paying much more for electricity than they would have to do for gas and they were still finding it quite tolerable. When they could say to a consumer that he could have a gas fire burning in the kitchen all day long at a reasonable charge, then he thought they would have got the results of the sort they dreamt about.

Mr. E. J. FOTTRELL (Joint Manager of the National Gas Council) said that the essential feature of Mr. Ridley's Paper was the emphasis on the need of starting aright. The whole basis was a proper understanding of business to-day; in other words, an analysis of the sales was essential. It might sound commonplace, but in his experience those undertakings which had made an analysis even on the lines of Table II. of the paper were lamentably few. They had to face the fact that everyone had forthwith to prepare an analysis of their existing consumption. Unless that was done, no intelligent attempt could be made to introduce any improvements in the method of charging. They had not perhaps considered sufficiently the large domestic consumer, the more or less prosperous section of the community. He was glad to observe that throughout the paper, Mr. Ridley had abstained from mentioning cubic feet. He felt that the Act which gave them the opportunity to use the therm had not been fully appreciated. One of the advantages their competitors had was the kilowatt as the unit of electricity measurement throughout the world. Yet the electrical authorities were at a disadvantage by having A.C. and D.C. and different voltages to contend with. Now they were contemplating changing to a new method of charge the opportunity should be taken of abandoning finally the cubic foot as a measurement.

Mr. JOHN E. COWEN (Chairman of the Newcastle and Gateshead Gas Company) said that the retention of existing consumers was, from the point of view of the capital invested, one of the first considerations. He had looked up the financial results of one or two large concerns in other parts of the country and he was disturbed to find how much new capital was being provided for new consumers while it did not bring in more income on the capital already invested. Anything that would encourage existing consumers to use more gas was undoubtedly the best thing they could do. It had been suggested that it was all very well for a prosperous dividend paying concern to talk of new tariffs. But if they let things go on then the question of dividends was bound to arise. If more money was put out in providing for new consumers, then more money would be required to maintain the dividend on the increased capital. Why should they not therefore give the difference to the consumer through some suitable form of tariff? They would probably get it back in increased consumption. Let those undertakings which said that they could not now afford to risk their income by giving a reduction in prices think what their position might be in the course of a few years if they did not. It might not influence them in the next year or two, but in a longer period of time he felt sure it would. Mr. Ridley's paper had shown that the large domestic consumer did appreciate good service and had increased his consumption of gas. It was reasonable to argue that the small consumer would if he could afford to. It was therefore apparent that they must offer some inducement to the small consumer. He did not decry good service in any way, but it would not sell gas to that type of consumer if the price were not right. The largest number of consumers were those who had to consider every copper, and they had to find a way of getting the price down to benefit these consumers who would respond, he thought, in the same way as the large domestic consumer. The surest way of doing this was by introducing such an attractive tariff, either two-part or block, after a certain economic point had been reached, as would pay the small consumer to take more gas.

The Author's Reply.

Mr. RIDLEY, in replying, said that complaint had been made that the memorandum on Methods of Charge recently issued by the National bodies was too general. He could not see that it could be otherwise than of a general nature and that it could not give figures from concrete experience. It was generally agreed that the circumstances in each case differed and must be treated individually.

Mr. Bradshaw said he did not like a room basis tariff. This and one of Mr. Curry's questions could be dealt with together. The average of the blocks for all sizes and numbers of houses shown in Table III. was 140 therms per annum, whereas the total of the blocks for a four-roomed house was 100 therms per annum.

If 140 therms per annum be converted into a tariff of 40 therms in each winter and 80 therms in each summer quarter as a straight block system for all sizes of houses on the same block prices as shown in the scale adopted, the amount of benefit to consumers would be £4,000 greater, the number of consumers benefiting would be 11% less and the incidence of benefits would be entirely changed because instead of 41% of the number of consumers in four rooms and under receiving benefit on the room basis, only 17% would obtain benefit on the straight block scale. On the room basis the numbers of consumers benefiting varied from 41% to 63%, whereas the straight block tariff when applied to the various consumers showed a variation from 17% to 92%, and that 73% to 92% of the consumers living in 9 to 15 rooms benefited. This therefore showed that the straight block tariff did not provide as great benefit or incentive to the small consumer as to the large consumer—a point made by Mr. Cowen—besides involving a greater loss of revenue.

Mr. Ridley agreed with Mr. Curry that the lower the existing price the more difficult it was to introduce attractive tariffs, but did not agree with him that the Newcastle two-part tariff had not been a success. He reminded him that it was introduced with the definite object of stopping the downward slide in sales to large industrial consumers. This had been achieved and increased sales had now been obtained. He also pointed out that Table II. showed that over 82% of the industrial and commercial consumers consumed less than 90 therms per quarter. He also pointed out that, as stated in the Paper, the industrial and commercial consumers on the two-part tariff represented 44% of the total gas sold to that group of consumers and he might add that the percentage was increasing. He also reminded the meeting of the statement in the Paper that the quality of a tariff should not be judged by the number of consumers benefiting but by the sale of gas it was likely to conserve and increase. With regard to Mr. Curry's second question, the room tariff as adopted gave benefit to a larger number of consumers in the summer than in the winter quarters, partly with a view to greater incentive to the development of the summer load. Mr. Ridley further said he wished to take the opportunity of thanking Mr. Scott and other assistants who had given great help in the preparation of the Paper, also Mr. Tarratt for helpful suggestions, and his Chairman, Mr. John E. Cowen, who although a busy man, had made time to go through the Paper and to give him very useful advice. He thanked him for such and for the honour he had paid the Association by attending the meeting.

Mr. D. CURRIE (South Shields) moved and Mr. C. F. BARROW seconded a vote of thanks to Mr. Ridley, which was carried with acclamation.

A vote of thanks to the President and members of Committee was proposed by Mr. G. W. MARTIN, seconded by Mr. F. P. FALL.

The Kettering Draft Gas Order

An inquiry was held in London on Friday, May 3, concerning an application by the Kettering Gas Company for a Special Order under the Gas Undertakings Acts, 1920-34. Mr. J. F. Ronca (Director of Gas Administration) held the inquiry and there were three opponents to the proposals of the Kettering Gas Company, which was represented by Mr. H. Royston Askew (barrister). Two of the opponents—the Kettering U.D.C. and the Rothwell U.D.C.—were represented by Mr. Jacques Abady, K.C., while the third objector—who was subsequently ruled as having no right to appear—viz., Imperial Chemical Industries, Ltd., was represented by Capt. Ellen, of the staff of the Company.

The objects of the Order were to extend the limits of supply, to raise additional capital, to consolidate existing capital, to authorize the manufacture and storage of gas on certain new lands, and generally to bring the legislation applying to the Company up-to-date. Mr. George Evetts has been advising the Company, and it was the original intention to call him to give detailed evidence, but owing to an agreement between the promoters and the Kettering U.D.C., during the proceedings, this was not necessary.

Mr. H. Royston Askew, for the Company, said that a striking development in Northamptonshire in recent years had been the development of iron ore in and around Corby, which was some 9 miles to the north of Kettering, and that had had the result of opening up new industrial areas. Messrs. Stewarts & Lloyds had built large iron works at Corby with large coke ovens, and the Kettering Gas Company, realizing the possibilities of obtaining supplies of gas from this source, entered into negotiations with Messrs. Stewarts & Lloyds, with the result that an agreement had been entered into by which the Gas Company would take all its supplies of gas from the coke oven plant and close down its own coal gas plant. Actually a high-pressure main had already been laid from Corby to Kettering, but at present the full supplies of the Kettering Company were not being taken from this source, as the agreement had not been in force very long. The arrangement was that the coke oven gas should be sent to Kettering in an unpurified state and at high pressure, and the Company would purify it at Kettering. There would also be a purifying plant at Corby so that gas could be supplied locally there by the Company without having to take it to Kettering for purification and then send it back again to Corby for local distribution. This agreement was for 21 years and thereafter until terminated by notice, as provided for. The Company, however, would construct a small stand-by water gas plant at Kettering which could be brought into operation at very short notice in case of emergency.

Counsel emphasized the point that the gas being obtained from Corby was not waste gas and would have been used by Messrs. Stewarts & Lloyds for their own purposes if the agreement had not been entered into with the Gas Company. This agreement was signed in July, 1934, the high pressure main had been laid during the autumn, and a supply of gas had been taken since Christmas, although the full supply was not yet being taken.

Wider Area of Supply.

Having these new resources, it was obvious that the Company should be able to offer facilities for gas supply over a wider area than the municipal limits of Kettering, and therefore an extension of the present limits of supply was proposed. It was now suggested that the Company should supply over an area between Corby and Kettering adjacent to the route of the high-pressure main, while certain additional parishes had been scheduled to the south and south-west of Kettering which could be supplied conveniently as and when the demand arose. There were, however, two exceptions. Within the proposed new limits of supply was Burton Latimer, which was now supplied by a non-statutory company—the Burton Latimer Gas Company, Ltd.—and provision was made in the Order that the Kettering Company should not supply in that parish. Then there was a provision with regard to the Urban District of Rothwell. The position in that case was that the Rothwell U.D.C. was an authorized gas undertaker, but a certain portion of its area came within the additional limits scheduled by the Kettering Gas Company, and it was provided in the Order that the Rothwell U.D.C., which had had powers to supply gas in this area for 35 years but had never exercised them nor had any mains been laid—no doubt because there was no demand—should cease to have these powers after the passing of this Order and that should any demand ever arise there for gas the Kettering Company should give it. He understood that a point of law would be raised by the Rothwell Council in this connection, and that it would be submitted that the Board of Trade had no powers to do what the Kettering Gas Company asked.

Speaking with regard to the differential price proposed in the Order, Mr. Askew said it was obvious that the cost of supplying these outer areas now proposed would be greater than the cost of supplying in Kettering, and therefore, in the interests of the Kettering consumers, it was asked that there should be a differential not exceeding 4d. per therm, as the cost of supplying would vary between the different parts of the proposed new area.

Coming to the capital powers, Mr. Askew said that the estimated capital requirements in the next ten years would be, in round figures, £93,000. It was proposed to consolidate the existing A, B, and C stocks into one uniform stock bearing a standard dividend of 5%, thus avoiding the inconvenience and confusion of having three stocks bearing different rates of standard dividends with different slides under the sliding scale. It was also proposed to raise £15,000 additional capital with additional borrowing powers.

Referring to the provisions in the Order for the establishment of reserve, special purposes, and renewal funds, attention was called to the fact that 7½% of the capital of the Company was asked for as the limit of the renewal fund, and Mr. Askew said that although in many cases 5% was the limit, the Board of Trade could allow 7½% in the case of small undertakings, and that limit was asked for in the present instance under the provisions of Section 5 of the Gas Undertakings Act, 1934.

Attention was then called to Clause 66 of the Order which stated that no main laid down by the Company under the powers of this Clause should be deemed to be a main within the meaning of Section 11 of the Gas-Works Clauses Act, 1871. The object of this, it was explained, was to prevent the position arising that a supply could be demanded from the high pressure main in any of the districts through which it passed, because obviously gas at the pressure at which it would be sent through that main could not be used direct for domestic purposes, and the Company would be placed in a difficult position without the provision to which reference had been made.

The Objections.

Dealing with the objections to the Order, Mr. Askew said that eight local authorities were entitled to be heard but only two of them—namely, the Kettering Urban District Council and the Rothwell Urban District Council—had put in an appearance. The Northamptonshire County Council had raised certain objections, but had withdrawn a number of them and left the remainder to be considered by the Board of Trade. The objection of the Rothwell Urban District Council resolved itself into the legal point as to whether the Board of Trade had powers to do what was asked in Clause 4 of the Order—namely, to prohibit the Urban District Council from supplying in a small part of its area which had been included in the new limits of the Kettering Gas Company, and within which the Rothwell Council at present had powers to supply but in fact had given no supply, in the circumstances already mentioned, although the powers had existed for a very long time.

As regards the opposition of the Kettering Urban District Council, objection was taken to the proposed differential of 4d. per therm, and it was also suggested that the power which the Company now had to charge on the basis of a standard price of 15·4d. per therm should be reviewed. The strongest possible objection, however, said Mr. Askew, was taken to such a suggestion because this was neither the time nor the opportunity for such a thing to be done. Another complaint of the Kettering Council was that the proposed capital requirements of the Company were far beyond those that were necessary, having regard to the capital expenditure in the past; but, said Mr. Askew, this suggestion completely ignored the fact that hitherto the Company's capital expenditure had been only in regard to Kettering, whereas, if this Order were granted, the capital expenditure would apply to a very much larger area.

Continuing, Mr. Askew said the only remaining opponent to the Order was Imperial Chemical Industries, Ltd., and he took the strongest objection to that Company being heard on this Order for the simple reason that in the words of their own document dated Jan. 14, 1935, they had no direct interest in the district of the Gas Company, and by that he assumed it was meant that they had no property in the area of supply of the Kettering Gas Company and did not take a supply from the Company.

The Director: Is it admitted that Imperial Chemical Industries, Ltd., has no property in this area?

Capt. Ellen agreed that this was so.

Mr. Askew, continuing, said that apparently the position of Imperial Chemical Industries was that something might be put into the Kettering Order which conceivably could be used as a precedent and might injure Imperial Chemical Industries in some other part of the country, in the future, where they did have interests, but if such a position was to be allowed it would open the door very wide at these inquiries.

Capt. Ellen, on behalf of Imperial Chemical Industries, Ltd., said that last year Parliament reviewed gas legislation and passed the Gas Undertakings Act, 1934, Section 21 of which related to the powers of undertakers entering premises for the purpose of inspection. During the consideration of that measure by Parliament Sub-Section 2 was added to Section 21, and this specifically denied the right to gas undertakers to enter factories and workshops for the purposes of inspection. That was the result of discussions between Imperial Chemical Industries and the National Gas Council and Parliament accepted that view.

The Director suggested that Captain Ellen should direct himself to showing that he was a person affected by this Order because if he were not he could not be heard.

Capt. Ellen, continuing, claimed that he was affected. The position was that if Imperial Chemical Industries, Ltd., allowed the Kettering Order to go through without protest they would definitely be met with a precedent in future cases. Another

matter in the Order to which objection was taken was Clause 78, which empowered the Kettering Gas Company to acquire, hold, and use any patent rights or licences for the use of any inventions in relation to the manufacture, supply, or distribution of gas or the conversion, manufacture, or utilization of residual products obtainable in or arising from such manufacture, or from the materials used therein. This, he submitted, enabled the Gas Company to trade in patents; and if that were to be permitted, Imperial Chemical Industries would again be affected, apart from any question of whether they had property in the district or not.

The DIRECTOR inquired how Imperial Chemical Industries were likely to be injured if the Gas Company obtained patents.

Capt. ELLEN said it would mean that Imperial Chemical Industries and gas undertakings in general would be competing in regard to trading in patents, and he contended that on these two points—namely, inspection and patents—Imperial Chemical Industries, Ltd., were likely to be injured by what was proposed in this Order.

At this point the luncheon adjournment was taken and the Director said he would consider the position during the interval.

I.C.I. Not Entitled to Hearing.

On resuming,

The DIRECTOR said he had considered the representations made on behalf of Imperial Chemical Industries and also the views expressed by Mr. Askew on behalf of the Kettering Gas Company, and ruled that Imperial Chemical Industries were not entitled to be heard at this inquiry.

Mr. ABADY, K.C., on behalf of the Kettering Urban District Council, said he had been considering the position in an endeavour to reduce his opposition to the smallest dimensions and was instructed to say that the Kettering Urban District Council would be satisfied to leave in the hands of the Board of Trade the various points raised in the objections that had been put in. They were, however, concerned with regard to the proposal to charge a differential not exceeding 4d. per therm in those parts of the added area, which, in fact, owing to an Order made under Section 46 of the Local Government Act, 1929, were part of the Kettering Urban District. These were the parishes of Barton Seagrave, Warkton, Thorpe, Malsor, Pytchley, and Weekley. The population of Barton Seagrave was 475, and there were only 178 houses in these five parishes of which 170 were in Barton Seagrave. Looking to the possible development in these areas the Kettering Urban District Council felt that there would be no justifications for the 4d. differential, and it was prepared to take the responsibility of agreeing with the Company that the price of gas in these parishes should be the same as it was in Kettering. That had been agreed between the Council and the Company, and in those circumstances he withdrew his active opposition to the Order subject to leaving the points raised to be considered by the Board of Trade. That offer had been made, he said, because there was every desire to continue the good relations between the Council and the Company.

Mr. ASKEW said he fully accepted, on behalf of the Gas Company, everything that Mr. Abady had said. He should, however, point out that the position of the Company had been that a supply to these parishes would involve an extra cost which would have had to be borne by the consumers in Kettering unless there was a differential, but as the Urban District Council offered no objection to the price being the same in the outer parishes as within Kettering itself, the position between the parties had been changed and the Company willingly fell in with the suggestion that the differential should not apply to the five parishes that had been mentioned.

Mr. ABADY then argued the legal point raised with regard to Clause 4 of the Order which seeks to prohibit the Rothwell Urban District Council from supplying the gas within a certain portion of its area which has now been scheduled as an additional area by the Kettering Gas Company. Dealing with this particular area Mr. Abady said it was very sparsely populated, there being only 19 inhabitants in 640 acres. There had never been any demand for a supply, and consequently the Rothwell Council had never given one, and these facts were admitted by the Gas Company. Nevertheless, he claimed that in the event of a demand arising the Rothwell Council was in a better position to meet it than the Kettering Gas Company, inasmuch as the gas main of the Rothwell Council was nearer to this particular area than the main of the Gas Company.

Mr. ASKEW disagreed with this view.

Mr. ABADY, continuing, said that apart from the facts in the case he submitted that the Board of Trade had no power to grant Clause 4. There was nothing in the general legislation applying to the Gas Industry which gave the Board of Trade power to authorize somebody to supply gas in a district within which there was an existing Company or Corporation which had not given a supply—although authorized to do so—for the reason that there was no demand and not likely to be one. Even Mr. Askew had agreed that there was no demand, and that there was not likely to be one, at any rate, for a very long time. Further, Mr. Abady submitted that even if the Board of Trade had the power it would not be right for it to be exercised in the special circumstances that had been mentioned. Finally, he mentioned that if the Board of Trade deleted this Clause, the Rothwell Council were willing to agree to give facilities to the Kettering Gas Company to lay mains through the district, without, of course, any power to give a supply there.

Mr. ASKEW submitted that the Board of Trade had jurisdiction to deal with the point on merits.

The inquiry then closed.

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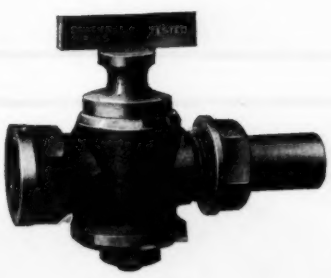

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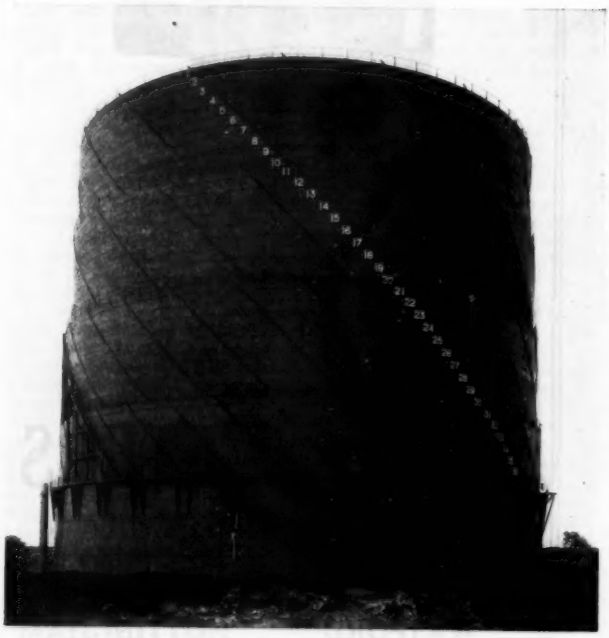

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BRITISH MATERIALS
BRITISH LABOUR
HIGHEST QUALITY
IN
WORKMANSHIP

70 YEARS' EXPERIENCE

MILBOURNE SELF-LUBRICATING ROLLER CARRIAGES

LONDON OFFICE — 70, VICTORIA STREET, WESTMINSTER, S.W.1

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

The fortnightly Account closed on Friday last with a strong tone in most sections, and though business during the week was still somewhat restricted there were indications of greater activity in many directions in the near future. Gilt-edged securities were well maintained, a feature being the strength of Conversion 3% at 106½, and a widespread upward movement took place in the Industrial market, especially among aviation, and iron and steel shares. There was also a revival of interest in gold-mining shares on dividend prospects, while brewery shares also gained ground. The only weak spot was the Home Rail market, where prices showed a general fall on the prospect of a reopening of the wages question.

The volume of business in Gas stocks and shares was well up to the usual for a short week. A good demand continued for Gas Light units, and the price hardened 3d. to 27s. 9d. Imperial Continental was also conspicuous and closed 2½ points higher at 217½. This Association has since announced a final ordinary dividend of 7%, making 12% for the year to March 31 last, the same as a year ago, and on this basis the yield on the middle market price works out at a shade over 5½%. Another important rise was that of Bristol 5% maximum, which showed a gain of 3 to 122 on the local Exchange, while Newcastle units were also moved up locally by 3d. to 25s. 6d. The market, however, was not without a few reserves, and these included a drop of 3 in Cape Town 4½% debenture to 87½, business being done down to 80, and a fall of 2 in Plymouth and Stonehouse to 167½.

Current Sales of Gas Products

The London Market for Tar Products.

May 13.

The prices of tar products remain as quoted on the 4th instant—namely:

Pitch, about 40s. per ton f.o.b.

Creosote, 5½d.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 1d. to 2s. 3d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d; and 90/160 pyridine, about 5s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

May 13.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 25s. Pitch—East Coast, 38s. to 40s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 38s. to 40s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6½d. to 6¾d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 4¾d. Heavy naphtha, North, 9¾d. to 10¾d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅜d. to 4¾d.; low gravity, 4⅜d. to 4¾d.; Scotland, 4⅜d. to 4¾d. Heavy oils, in bulk, North, 4d. to 4¼d. Carbolic acid, 60's, 2s. to 2s. 1d. Naphthalene, £10 to £11. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *May* 11.

If anything there has been more activity during the week but no material alterations have taken place in values.

Crude gas-works tar.—The actual value is 28s. to 30s. per ton *ex* works in bulk.

Pitch.—Although export value is called 40s. to 42s. per ton f.o.b. Glasgow, a reduction could probably be obtained with firm business. The price *ex* works in bulk for home trade is unchanged at about 40s. per ton.

Refined tar continues to command considerable attention, but price is still easy at 3d. per gallon naked at makers' works.

Creosote oil is moving in considerable quantities against old contracts, but new business is not quite so plentiful. Prices are, however, unchanged as under: B.E.S.A. Specification, 5d. to 5¼d. per gallon; low gravity, 5d. to 5¼d. per gallon; and neutral oil, 5d. to 5¼d. per gallon; all f.o.r. in bulk.

Cresylic acid.—Market conditions are quiet and to-day's values are as follows: Pale, 97/99%, 1s. 1½d. to 1s. 2½d. per gallon; dark, 97/99%, 1s. to 1s. 0½d. per gallon; and pale, 99/100%, 1s. 2½d. to 1s. 3½d. per gallon; all *ex* works.

Crude naphtha.—Available supplies are negligible and command 4¼d. to 4¾d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3d. to 1s. 3½d. per gallon, and 90/190 heavy naphtha is 10d. to 11d. per gallon.

Motor benzole is still available at 1s. 2d. to 1s. 3d. per gallon in bulk *ex* works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade, 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole	0 9½	to	0 10	per gallon at works
Motor "	1 3	"	1 3½	" " "
90% "	1 4	"	1 4½	" " "
Pure "	1 7½	"	1 8	" " "

Contracts Advertised To-Day

Coal.

Conway Corporation. [p. 398.]
Ilkeston Gas Committee. [p. 398.]
Skipton Gas Department. [p. 398.]
Stratford-on-Avon Gas Department. [p. 398.]

Mainlaying.

Stafford Gas Department. [p. 398.]

Meters.

Stockton-on-Tees Gas Department. [p. 398.]

Pipes.

Rochdale Gas Department. [p. 398.]
Stockton-on-Tees Gas Department. [p. 398.]

Purifying Material.

Carlisle Gas Department. [p. 398.]
Rochdale Gas Department. [p. 398.]

Stores.

Stockton-on-Tees Gas Department. [p. 398.]

Trade Notes

Universal Dryers Company, Ltd.

The Sole Manufacturing and Selling Licence of the Universal Dryer hitherto held by the Brightside Foundry and Engineering Company, Ltd., of Sheffield, has been terminated by Universal Dryers Company, Ltd., of 14, Regent Street, Barnsley, as from May 6, 1935. Mr. R. V. Farnham, the patentee and designer of the Universal coal dryer, is now the Engineer and Manager of the latter organization. Examples of the Company's coal dryer have been in successful operation at the Barrow-Barnsley Coke Ovens, near Barnsley, and the Emlyn Collieries, near Swansea, since 1931. Besides a 40-tons per hour dryer installed in Canada, a recent order has been completed for the Houghton Main Colliery Company.

Gas Undertakings' Results for 1934

Radcliffe.

The Radcliffe and Little Lever Joint Gas Board report a gross profit for the past year of £24,300, but so heavy are the sinking fund and loan charges arising out of a comparatively recent municipalization of the Undertaking, that the net profit is only £254, reducing the net deficiency to £388. The popularity of prepayment meters in the area covered by the Undertaking is indicated by the fact that among 16,748 domestic consumers no fewer than 10,329 are using this type of meter.

ONE OF THE WELL-KNOWN FEATURES OF

WEST'S MECHANICAL HANDLING SYSTEMS

The West Suspended, Reciprocating Coke Grader

•

The West-Calvert Coke Cutter

•

The West Lip-bucket Conveyor with Automatic forced Lubrication

•

Belt Conveyors, Elevators, Skip-hoists

•

Wagon Tipplers, Telpherage and Crane Equipment

•

The West Coal Breaker, etc.

THE CULTIVATION OF COKE MARKETS . . .

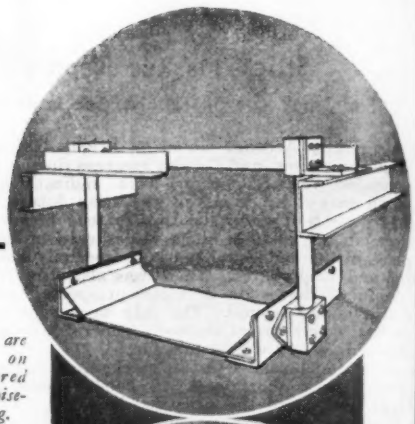
has been found to depend for its success very largely on the undertaking's ability to grade to consumers' requirements. This important question has engaged the attention of our technical staff over a long period, with the result that the West Suspended Reciprocating Coke Grader of to-day is a highly developed machine with the following outstanding advantages:

Produces clean gradings, ready for direct loadings and delivery;

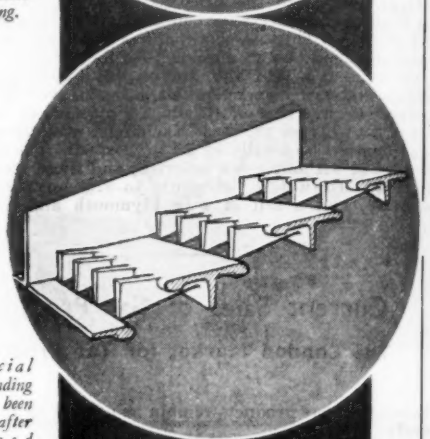
Is noiseless in operation, disposing of a notorious problem in plant of less advanced design;

Is smooth in movement, creating no structural vibration; and

Involves a minimum maintenance cost, elaborate components having been avoided.



Grader trays are suspended on rubber-covered hangers for noiseless working.



The special design of grading racks has been perfected after prolonged experiment.

A portion of the coke grading unit at the New Wortley works of the Leeds Corporation Gas Department.

A West UNIT

THE *West* COKE GRADER

WEST'S GAS IMPROVEMENT COMPANY, LTD.

MANCHESTER: Albion Ironworks, Miles Platting LONDON: Regent House, Kingsway, W.C.2

STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, May 10.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	128—138	...	139 5/16
374,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	90—100	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	165—170	...	...
300,000	1	Apl. 8	1/4 1/8	1/9 3/8	Bombay, Ltd.	27/6—29/6	...	...
178,480	Stk.	Feb. 18	9 1/8	9 1/8	Bournemouth sliding scale ...	220—230	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	167—172	...	170 1/2—171 1/2
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	148
50,000	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	86—91	...	87 1/2
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	107
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	127 1/2—129 1/2
357,900	,,	Feb. 18	7 1/2	7 1/2	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6 1/4	6 1/4	Do. 5 p.c. Con. ...	153—158	...	155 1/4
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150	...	...
1,487,500	,,	Feb. 4	5	5	Bristol, 5 p.c. max.	121—123*a*	+3	...
120,420	,,	Dec. 17	4	4	Do. 1st 4 p.c. Deb. ...	102—104*a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	102—104*a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	122—124*a*	...	...
855,000	,,	Mar. 11	7	8	British Ord.	152—162	...	156—160
100,000	,,	Dec. 17	7	7	Do. 7 p.c. Pref.	150—160	...	...
350,000	,,	,,	5	5 1/2	Do. 5 1/2 p.c. "B" Cum. Pref.	114—119	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—102	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	111—116	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4 1/2	4 1/2	Do. 4 1/2 p.c. Pref. ...	1—3	...	...
150,000	Stk.	Dec. 17	4 1/2	4 1/2	Do. 4 1/2 p.c. Deb. ...	85—90	−3	80—90
626,860	,,	Jan. 21	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	Dec. 17	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	,,	Feb. 4	5	6 1/2	Chester 5 p.c. Ord.	111—116*b*	...	...
98,936	1	Mar. 25	2/-	2/-	Colombo, Ltd., Ord.	1 3/8—1 1/2	...	...
24,500	1	,,	1/4 1/8	1/4 1/8	Do. 7 p.c. Pref. ...	20/6—22/6	...	...
609,204	1	Mar. 25	-/11/48	-/11/48	Colonial Gas Assn. Ltd. Ord.	20/—22/-	...	20/3
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	24/6—26/6	...	26/6
1,775,005	Stk	Feb. 4	5	6	Commercial Ord.	108—113	−1	108
475,000	,,	Dec. 3	3·	3	Do. 3 p.c. Deb. ...	85—90	...	85
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
807,560	,,	Feb. 18	7	7	Croydon sliding scale... ...	155—160	...	...
569,590	,,	,,	5	5	Do. max. div.	112—117	...	113 1/2
620,385	,,	Dec. 17	5	5	Do. 5 p.c. Deb.	125—130	...	...
542,270	,,	Feb. 18	7	10	Derby Con.	185—195*c*	...	...
55,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	100—105*c*	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c. ...	111—116	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	...	133
175,609	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
1,002,180	,,	Mar. 11	†	†7	European, Ltd.	109—114	...	109 1/2—111
19,313,481	,,	Feb. 4	5 1/2	5 1/2	Gas Light & Coke 4 p.c. Ord.	27 3/—28 3/*f*	+-3	27/4 1/2—27/9
2,600,000	,,	,,	3 1/2	3 1/2	Do. 3 1/2 p.c. max. ...	85—90	...	86 1/2—87 1/2
4,477 106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	104—109	...	105 1/2—107
6,102,497	,,	Dec. 3	3	3	Do. 3 p.c. Con. Deb. ...	88—93	...	90—91 3/4
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—120	...	116 3/4
3,500,000	,,	,,	4 1/2	4 1/2	Do. 4 1/2 p.c. Red. Deb. ...	111—116	...	113 1/2—114 1/2
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140	...	...
140,000	1	Mar. 25	1 7/8	1 7/8	Hongkong & China, Ltd. ...	1 1/2—1 5/8	...	...
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3 1/2 p.c....	128—138	...	...
5,600,000	,,	Oct. 22	14	10	Imperial Continental Cap. ...	215—220	+2 1/2	216 1/2—219 1/2
223,130	,,	Jan. 21	3 1/2	3 1/2	Do. 3 1/2 p.c. Red. Debs.	91—96	...	...
285,242	,,	Feb. 18	8 1/2	8 1/2	Lea Bridge 5 p.c. Ord. ...	172—182	...	...
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord.... ...	136—140*b*	...	...
245,500	,,	Dec. 17	5	5	Do. 5 p.c. Red. Pref. ...	105—110*b*	...	...
306,083	,,	Jan. 16	4	4	Do. 4 p.c. Deb.	104—107*b*	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	83—88	...	...
75,000	,,	Dec. 3	†10	†10	Malta & Mediterranean ...	205—215	...	...
392,000	—	Apl. 1	5 1/2	5 1/2	Metropolitan (of Melbourne) 5 1/2 p.c. Red. Deb.	100—105	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	105 1/2
360,075	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	125—130	...	...
125,000	—	Jan. 2	11/8	3 1/2	Do. 3 1/2 p.c. Rd. Rg. Bds.	98—101	...	...
675,000	,,	May 28	†6	†3	Montevideo, Ltd.	50—60	...	...
2,061,315	,,	Feb. 18	5	5 1/2	Newcastle & Gateshead Con.	25/—26/-*df*	+-/3	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107*d*	...	...
776,706	,,	Dec. 17	3 1/2	3 1/2	Do. 3 1/2 p.c. Deb. ...	101 1/2—102 1/2*d*	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107*d*	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	108—110*a*	...	...
225,000	,,	Feb. 18	7 1/2	7 1/2	North Middlesex 6 p.c. Con.	170—175	...	...
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	167—172*	...	...
416,617	,,	Dec. 17	8	8	Plym'th & Stonehouse 5 p.c.	165—170	−2	...
504,416	,,	Feb. 4	8	8 1/2	Portsm'th Con. Stk. 4 p.c. Std.	173—178	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	Jan. 21	5	5	Preston 5 p.c. Pref.	108—113	...	...
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	141—143*e*	−1	...
95,000	,,	Jan. 7	4	4	Do. 4 p.c. Deb.	103—106*e*	...	...
133,201	,,	Feb. 18	8 1/2	5	Shrewsbury 5 p.c. Ord. ...	142—147	...	...
90,000	10	May 28	†4	†3	South African	3—4	...	...
1,061,779	1	Sept. 10	1/2‡	1/2‡	South East'n Gas Cn. Ld. Ord.	27/—29/-	...	28/3—28/6
845,016	1	Mar. 11	-/10 1/2	-/10 1/2	Do. 4 1/2 p.c. Red. Cum. Pref.	21/9—22/9	...	22/—22/7 1/2
450,000	Stk.	Feb. 4	74/4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Feb. 4	5	6 1/2	South Met. Ord.	131—136	...	132 1/2—134 1/2
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	148 1/2—149 1/2
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	104—109	...	...
1,895,445	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	87—92	...	90
1,000,000	,,	Jan. 7	5	5	Do. 5 p.c. Red. Deb....	113—118	...	...
209,820	,,	Feb. 18	8 1/2	8 1/2	South Shields Con.	174—176*d*	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	130—135	- 1/2	133 1/2
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	+1	123—125
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	102—107	...	103 1/2—104 1/2
888,587	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	124—129	...	125
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	114—119	...	...
121,275	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	102—107	...	...
350,000	,,	Feb. 4	5 1/2	5 1/2	Swansea 5 1/2 p.c. Red. Pref. ...	115—120	...	...
200,000	,,	Dec. 17	6 1/2	6 1/2	Do. 6 1/2 p.c. Red. Deb. ...	100—105	...	104 1/2—105
1,076,490	,,	Feb. 18	6 1/2	6 1/2	Tottenham and District Ord.	148—153	...	148 1/2—150 1/2
409,835	,,	,,	5 1/2	5 1/2	Do. 5 1/2 p.c. Pref. ...	131—136	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	122
199,005	,,	Dec. 3	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	150—155	...	...
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	...
1,326,700	,,	Feb.	7	7	Wandsworth Consolidated ...	155—160	...	155—157 1/2
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	...
1,317,964	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	126—131	...	...
208,300	,,	,,	26/8	4	Do. 4 p.c. Deb. ...	104—109	...	...
158,400	,,	Feb. 18	5	6*g*	Winchester W.& G. 5 p.c. Con.	116—121	...	...

Quotations at :—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. *f*.—The quotation is per £1 of Stock. *g*.—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

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(*See advertisement May 8, p. 295.*)

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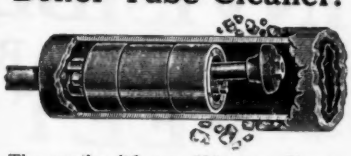
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WE ARE NOT REALLY CONCERNED WITH YOUR GIRTH OR AVOIRDUPOIS; WHAT WE WANT TO BRING HOME TO YOU IS THAT—*YOU CANNOT SEE YOUR* CUBIC FEET OF GAS AND THAT IT BEHOVES YOU, THEREFORE, TO EMPLOY A GOOD METER TO WATCH THEM —*THE* 'A E M' METER *FOR INSTANCE*

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